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**HEREDITY AND SELECTION IN
SOCIOLOGY**

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HEREDITY AND SELECTION IN SOCIOLOGY

BY
GEORGE CHATTERTON-HILL



LONDON
ADAM AND CHARLES BLACK
1907

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TO

E. R. V.,

WHOSE FELLOWSHIP AND HELP
HAVE MADE DARK DAYS BRIGHT

AUTHOR'S PREFACE

It is an agreeable duty for me to convey to Professor J. Arthur Thomson the expression of my warmest gratitude for his very great kindness and courtesy in revising the first part of my work, and also for the invaluable assistance which he has rendered me throughout. I would like, also, to take this opportunity of expressing my hearty thanks to Mr. Benjamin Kidd, to whom I am indebted for many helpful suggestions and for much valuable criticism ; to Dr. J. W. Slaughter, to whose never-failing courtesy I owe the avoidance of considerable material difficulty caused by my absence from England ; and to my friend Dr. Maurice de Fleury.

G. C.-H.

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INTRODUCTION

WITH regard to the general aim and scope of this work, and to sum up the latter concisely, we might say that Part I. aims simply at an exposition of the facts of heredity and selection, based more especially on the researches of Weismann ; Part II. examines the question as to whether social polity at the present moment tends, in the light of this knowledge, to what we have called the biological and traditional progress of the race ; Part III., after examining the system on which our social polity is based (Liberalism) and the system which it is proposed to substitute for it (Socialism), deals with the possibility of founding a social polity capable of maintaining the efficiency of Western society, alike from the biological and from the purely social standpoint.

It may be objected that Part I. deals too lengthily with purely biological questions, and that it is somewhat technical for a book purporting to come within the category of sociological works. This objection seems to us unfounded, for surely a study of social questions requires most emphatically a knowledge of the laws of heredity and selection, considering that, as Herbert Spencer long ago pointed out, there exists no social phenomenon which has not its roots in the phenomena of life itself. An exposition of the rôle played by selection in the domain of organic life is necessary in order to prepare the mind to understand the importance of selection in the domain of social life. If we are able to appreciate the omnipotence of *Naturzüchtung* in the life

of organisms, we shall be able, also, to appreciate the action of the same *Naturzüchtung* in the life of societies.

We have laid stress upon the importance of conflict in social evolution, as being indispensable in order to ensure the efficacy of the action of selection. Concerning the rôle of selection in sociology, it is necessary to bear in mind that the efficiency of any given society not only signifies the power of resistance which that society is capable of manifesting with regard to other societies, its competitors in the struggle for existence ; but also the power of resistance which it is capable of manifesting with regard to the antagonisms, economic or otherwise, which arise within its own ranks—between the different strata, so to speak, of its own population. The equilibrium necessary to the continuity of the life of a society is thus at once determined by internal and external factors. A society weakened by internal dissensions, by the absence of any principle capable of directing the individual activities of its component members towards the accomplishment of a common purpose, in which the different individuals are as so many loose molecules without cohesion, is a disintegrated society, incapable of defending its integrity against assaults from without. Such a society must inevitably succumb when confronted by stronger rival societies ; even as, in the biological sphere, the weaker organisms are destroyed by the stronger organisms.

In treating of the question of heredity and selection in sociology, we must beware of the tendency to consider society too exclusively as an organism, or sociology as a mere branch of biology. Social evolution is governed by laws *sui generis*. That all the phenomena of social life have their root in vital phenomena is unquestionably true ; none the less are social phenomena autonomous. All the phenomena of life, in their turn, have physico-chemical laws as their basis ; yet because the physico-chemical sphere embraces the biological sphere, the science of biology is none the less a science *sui generis*, dealing

with phenomena *sui generis*, which are not to be found in the domain of physico-chemical forces. In the same way, life having reached a certain degree of complexity, the laws which govern the elementary phenomena of individual life are insufficient to explain the complicated phenomena of organised life. Life, having attained to the organised stage, develops phenomena *sui generis* peculiar to this stage, and which are not to be found in the sphere of unorganised life with which biology alone deals. Social phenomena differentiate themselves from other vital phenomena in that the former are of essentially moral nature.

We must regard thought, reasoning, and all the psychological developments which characterise social life, as so many products of that social life, as derived from the continuous cerebral interaction between vast numbers of heterogeneous mentalities having arrived at an active consciousness of the differentiation of the world of "ego" and the world of "non-ego." Psychology falls into two sections, according as we consider the individual or the social aspects of thought. We would use the term *psychosocial* to characterise the nature of the religious beliefs, of the codes of law and jurisprudence, of the philosophical doctrines, of the political theories, and of all other phenomena which have their origin in social life. Certainly, the genesis of the manifestation of thought in the individual may be left to the psychologist; but we have also—from another standpoint—the right to see in psychological phenomena a resultant of social life; and, as such, these phenomena may be designated as psychosocial, and included in the domain of the sociologist. Society is a superorganic type *sui generis*; and the irreducible element which characterises society, and which differentiates sociology from psychology and from all the other sciences, is the psychosocial phenomenon.

Society being thus characterised by an element which differentiates the social type from the organic type, we may consider this element as assuming a preponderating rôle in the measure

that social evolution progresses. For the more does social life become complicated, the more will the fundamental characteristic of social life—i.e., the psychosocial phenomenon—tend to develop itself. The intellectual powers of man, developed throughout thousands of years of psychological interaction, are thus transmitted from generation to generation; each new generation leaves upon this patrimony of society its particular impress, and in the course of time an immense sum of forces is engendered by social life. We see to-day these great social forces subordinating to themselves the forces of Nature—heat, light, electricity, water, the winds—and we see them “carrying the science of healing, the means of locomotion and correspondence, every mechanical art, every manufacture, everything that promotes the convenience of life, to a perfection which our ancestors would have thought magical.”¹ We may thus say that, if all social phenomena have their roots in vital phenomena, the history of social evolution has been, nevertheless, the history of one long effort on the part of the socialised individual to emancipate himself from, and to subdue, those forces which control so despotically the life of all the species inferior to man.

But does this emancipation of the socialised human being justify the conclusion that the latter is not subjected to, or is subjected in a lesser degree to, the discipline which ensures among the other species the exclusive survival of those individuals whose constitution is adapted to their conditions of life? The reply must be emphatically in the negative. The human being does not cease, because he is incorporated in a society which is *sui generis*, to be an animal. If on the one hand the faculties which have been developed by social life in the course of countless generations differentiate him from all other organisms; on the other hand, by his individual constitution, he is linked to all the innumerable animal ancestors which have preceded him. Selection is a universal discipline of Nature, for

¹ Macaulay, *Essays*, p. 825.

selection is an indispensable condition of life. The very idea of Evolution implies progress, though whither that progress ultimately tends we cannot say ; and progress is impossible unless selection permit exclusively of the survival of the fittest, consequently of those who alone are capable of accomplishing any progress.

Even as the social sphere differentiates itself by phenomena *sui generis* from the biological and physico-chemical spheres, so does selection operate within it in a distinct manner. Selection utilises the forces which social life has developed, in order to convert them into instruments for ensuring the progress of society and for eliminating those elements which impede progress. Among the other species the test of fitness is a purely physical one ; among the inferior types of the human species, also, physical superiority is alone sufficient. But as social evolution slowly develops types of greater complexity of structure, and engenders forces which are absent from among other living types, these forces assume a *rôle* of ever greater importance in the determining of the fitness or adaptive capacity of a society. Not that physical qualities come to lose any of their importance ; on the contrary, physical qualities play as decisive a *rôle* in the evolution of the higher forms of human society as in the evolution of every other form of life. But with the development of social life there is added another criterion of fitness as important as the physical criterion. It is not sufficient for a society to be composed of physically fit individuals ; it must possess, also, certain qualities of cohesion and integration which are likewise indispensable to it in the struggle for existence with other societies. For without this cohesion and this integration, a society will be torn asunder by the conflicting interests of the different elements which compose it. But a society can endure only on condition that it have an aim, a common purpose, a common ideal, towards the realisation of which all the efforts of all its component individuals must be directed. Hence the cardinal importance of a

great social principle with sufficient hold over the individuals composing society to be able to dominate the greater part of their individual life, and to guide their efforts and aspirations in one direction, towards one goal. Such a principle must needs impress upon all the individual members of society the primordial fact of their solidarity. It may be religion, it may be patriotism, it may be professional honour and interests—in the absence of any such principle capable of co-ordinating the activities of the heterogeneous mentalities composing a society, the latter will tend to break up into a number of loose molecules, each group of which is conscious only of antagonism to the others. Disaggregation is but the prelude to an inevitable disintegration and disruption of society; hence it behoves us to prevent any such disaggregation. But this we can do only if we find a principle capable of bringing home to each individual the fact of his essential solidarity with all the other individuals adherent to the same principle.

It will be, perhaps, objected that, in the third part of this work, we have identified the terms "supra-rational" and "religious"; and that we have opposed "religion" to "Socialism" and "science." The "religion of science" is a term with which we are all familiar, and its adepts willingly speak of the "religion of Socialism"; and it may consequently be argued that the opposition between "religion," on the one hand, and "Socialism" and "science" on the other, is unfounded. We may say at once that we have used the word "religion" in the popular acceptance of the word, as synonymous with "supra-rational." Socialism makes no appeal to supra-rational principles—at least, not openly; and, indeed, both the "religion of Socialism" and the "religion of science" profess to be free from any taint of supra-rationalism; their adherents are for ever contrasting the "natural ethics" and "rational morality" of their creed with the supra-natural ethics and supra-rational morality of the Christian creed. If

Socialism and science have appropriated the word "religion," we must see in this appropriation a perhaps unconscious tribute to the importance of the religious—i.e., supra-rational—ideal in social life ; and this shows us again that religion is not so hopelessly condemned by the "progress of social evolution" as many think ; since those who are professedly detached from religion in the popular acceptance of the word, and who would fain see every trace of Christianity vanish in the mists of the past, have nevertheless to borrow their weapons from the adversary who, according to them, is in imminent danger of annihilation.

If we have contrasted "religion" with "Socialism" and "science," it is because we desired, in the first place, to contrast "supra-rationalism" with "rationalism"; and, in the second place, because we wished to show that every society, if it is to survive in the struggle for existence, must necessarily owe allegiance to a certain number of supra-rational principles—or, in a word, that a society which is wholly "rationalist," and from which all trace of supra-rationalism has been banished, must, sooner or later, infallibly succumb as the result of its own incoherence and disintegration. The "religion of Socialism" and the "religion of science" are professedly "rationalistic"; and the only real "religion"—i.e., supra-rational code of principles—adapted to the needs of our Western civilisation is the Christian religion. We have identified religion with supra-rationalism because every real religion, in the exact sense of the word, is based on supra-rational dogmas ; and for the purpose of this book we have identified religion with Christianity, because Christianity is the only form of religion intimately adapted to the social life of Western nations.

Our meaning being thus made clear, we may dwell on the fact that, notwithstanding their hostility to the popular forms of religion, the "rational" religions of which we have spoken have none the less paid their tribute to that which they profess to destroy and supplant. This argument has been developed

in Part III., Chapter IV. And such must inevitably be the case if we reflect that the moral law consists in a *subordination of the individual to an exterior power*. There is no such thing as "natural religion" or "natural ethics," if we understand by these terms a religion or an ethical code derived from "Nature." Nature is not a moral entity; there is no morality in Nature. And if we profess to derive an ethical law from Nature, we are deriving this law, not from Nature as she *is*, but from Nature as *we see her*—and this is an entirely different thing. When we set about to discover a foundation for the moral law which is to be purely rationalistic, and when we think to discover this foundation in Nature herself, we are crediting Nature with qualities she does not possess, we are reading into the book of Nature metaphysical conceptions of our own, whether we will it or not. As soon as appeal is made to a moral law, appeal is made to something surpassing the individual, to something the validity of which we assume *quod semper, quod ubique, quod omnibus*. Consequently, this "something" cannot be contained in the individual reason, the validity of which is purely personal; it must of necessity transcend individual reason; or, in other words, it must be supra-rational. Rational moralists, once they attempt to discover the categorical imperative, appeal to the supra-rational.

We have made no attempt in the following pages to approach the subject from the standpoint of an apologist of the dogmas of Christianity. With the dogmatic and mystical principles of any religion the sociologist has no concern whatever. Just as little could it be inferred that the present book is a vindication of the religious principles of the Catholic Church. With such principles the sociologist has nothing to do; they lie outside his domain. Anticlericalism is a necessary and permanent condition of existence for the civil power in every country, provided we understand by this term the perpetual and indispensable separation between the ecclesiastical and the civil spheres of

government, and the undisputed supremacy of the civil power in all matters concerning the State. The sociologist must be entirely at one with the government which seeks to safeguard the legitimate interests of society against clerical aggression, and which endeavours jealously to preserve intact the precious patrimony of free thought and inquiry bequeathed to us by our forefathers.

The sociologist considers the religious and metaphysical systems of humanity, as also all codes of ethics, law, and jurisprudence, all philosophical and political doctrines, as the products of social life—in a word, as *psychosocial* phenomena. Every religion must be considered as an instrument for effecting the adaptation of society to its environment. Even as the unceasing perturbations of intragerminal nutrition perpetually bring forth tiny variations of the organism, so that, when a change of environment requires readaptation, natural selection finds, in 9,999 cases out of 10,000, the necessary variation to select, thereby ensuring the survival of the biological species; so the unceasing activity of intrasocial energy is perpetually producing new variations of the social type, in order that here also selection may always find at its disposal the necessary variant which, by being selected, shall ensure the continuity of the social species. The necessities of adaptation and readaptation call forth, in the one case as in the other, a countless number of variations; for otherwise the organism, whether biological or social, would be exposed to too great a risk of annihilation. Selection perpetuates those variations which are useful, and destroys those which are not.

Religion may be regarded as a social variation which has been selected, and subsequently maintained by the unceasing intervention of selection, because it is indispensable to the social species in the struggle for existence. Those tribes who possessed no religious ideal must inevitably have been exterminated by those who did possess one; for the former were less adapted to the requirements of the social environment; they possessed less

power of expansion, for religion is one of the highest forms of expansion, both social and individual. But the race or tribe whose power of expansion is less must succumb in the struggle with adversaries possessed of greater expanding power; and the possession of a religious ideal, however vague, implies a certain degree of expanding power. Ethnology confirms this view. In the measure that social evolution progressed and became more complicated, in the measure that the heterogeneity of social types augmented, religious beliefs and institutions became more complicated; and even as the most primitive forms of ancestor-worship are found among the most primitive peoples, so the most developed forms of religion are found among the most highly evolved—the ancient Greeks, the Chinese, the Europeans. But what does this mean, if not that the evolution of religious beliefs has proceeded *pari passu* with the evolution of society, with the ever-growing expansion, biological, economic, and moral, of humanity?

The question may be raised as to why religion is such an indispensable social variation, why human expansion manifests itself invariably, under one of its aspects, as an expansion of religious ideals. We have no intention here of attempting to solve this question. It has been said by Quatrefages that man is a religious animal; and this is true if we mean thereby that religion is an indispensable social variation, which apparently must be manifested if the survival of the society is to be effected, and that it is consequently an indispensable instrument of social adaptation. Man, as we know him everywhere to-day, with perhaps a few insignificant exceptions among the lowest savages, is essentially a "metaphysical animal," whether he know it or not. The savage who imagines his other self to go away in dreams, and who, knowing nothing of the phenomenon of death, places food and drink in the dwelling of the fellow-tribesman whom he expects to see return, is a primitive metaphysician; and as social life becomes ever more and more evolved, this

apparently inherent metaphysical tendency evolves also. Those who to-day would fain relegate metaphysics to the museum of antiquated superstitions are themselves metaphysicians, bent on discovering the basis of that most metaphysical of conceptions, the moral law. And Max Stirner, who rejected all religion and all morality, because religion and morality subordinate the individual instincts to a metaphysical entity exterior to him, was compelled, against his will, to invent a new metaphysical entity, the *Ego*, or *Ich*.

But further than this the sociologist cannot go. He considers religion and metaphysics, like all other psychosocial phenomena, as products of social life, as evolved and maintained by the necessities of social life. Hence he must judge irrational all theories which treat religion as a negligible factor of social evolution, whether in the present or future. Placing himself at a higher and more philosophical point of view, he is able to recognise, on the contrary, the fundamental importance, the indispensable nature of religion as a social factor. Religion will not become antiquated, because social life without religion is impossible except at an advanced stage of social regression, when a society has lost all power of expansion. With the dogmatic principles of any religion in particular the sociologist has no concern; he will, perhaps, feel inclined to say with Nietzsche: "It is not necessary that anything should be true; it is only necessary that we should believe something to be true."¹

¹ *Werke*, xv. 274. Nietzsche has said many excellent things concerning religion as a product of social expansion—as an expression of the *Wille zur Macht* of a society. For instance, he says (*Werke*, xv. 275): "Das Mass des Erkennen-wollens hängt von dem Mass des Wachsens des Willens zur Macht der Art ab: eine Macht ergreift so viel Realität, um über sie Herr zu werden, um sie in Dienst zu nehmen." This means that the religious system of every society corresponds to the power of expansion of that society, consequently to its social fitness. That religion is a product of selection, maintained by the constant intervention of selection, owing to its necessity for society in the struggle for existence, Nietzsche has fully recognised when he writes (*Werke*, xv. 273): "In den Wertschätzungen

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It has been objected to us that we have not dealt with the very important subject of the increase in the rate of crime. To this objection we would reply that, if we have omitted to deal with this grave symptom of social pathology, it is not because we in any way underestimate its importance, but simply because, after the publications of the Italian school of criminologists, especially Ferri, Garofalo, and Sighele, there remains little to be said which is either very new or very interesting. Those who are interested in the question of the social aspects of crime cannot do better than consult the works of Ferri and Garofalo; but this study must be prefaced by that of the monumental work of Lombroso.

drücken sich Erhaltungs- und Wachstumsbedingungen aus. Alle unsere Erkenntnisorgane und Sinne sind nur entwickelt in Hinsicht auf Erhaltungs- und Wachstumsbedingungen. Das Vertrauen zur Vernunft und ihren Kategorien, zur Dialektik, also die Wertschätzung der Logik beweist nur die durch Erfahrung bewiesene *Nützlichkeit* derselben für das Leben, nicht deren Wahrheit." And he speaks of the most fundamental *a priori* notions of humanity as "sehr gut eingeübte Gewohnheiten des Glaubens, so einverleibt, dass nicht daran glauben, das Geschlecht zu Grunde richten würde."

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PART I
THE THEORY OF DESCENT

HEREDITY AND SELECTION IN SOCIOLOGY

CHAPTER I

THE FACTORS OF EVOLUTION

THE first modern writer to direct attention to the rôle of the racial factor in history was the Comte de Gobineau, who, in his work on the *Inequality of the Human Races*, gave an eloquent description of the causes which appear to bring about the rise and fall of nations.¹ Gobineau's work was but little noticed at the time, and it was in Germany, among the Wagnerian circle at Bayreuth, that the reputation of the author was first established. Gobineau's writings, considered from a strictly historical point of view, cannot be regarded as in any way increasing our knowledge of the causes determining the birth and death of nations in any concrete case. It is rather the general idea of the *Essai sur l'Inégalité* that is of value, for Gobineau was the first historian to see in the racial factor the fundamental condition of all social evolution.

The theory of social evolution advanced by Gobineau in 1853 has found ample confirmation in the biological discoveries which have taken place since his time, especially in those associated with the name of Charles Darwin. The publication of the

¹ Joseph Arthur de Gobineau, *Essai sur l'Inégalité des Races Humaines*. 4 vols. Paris, 1853; 2nd edition, 1876.

Origin of Species, in 1859, not only laid the foundations of modern biology, but was the dominant impulse of many of the fruitful and important researches which marked the last forty years of the nineteenth century as the great era of scientific progress.

Despite the revolution effected by Darwin, not only in the special sphere of biology, but also in our whole conception of the world, there has been little or no application of Darwinian doctrine to sociology until within quite recent years. It is true that Herbert Spencer had already applied the theory of the survival of the fittest to the life of human societies, before Darwin had applied it to the life of species in general ; but while Spencer's conception of the part played by natural law in sociology was luminous and fruitful, the illustrious author of the *Synthetic Philosophy* made no attempt to give us a synthesis of social history considered from the evolutionist standpoint. Such a synthesis does not yet exist. But, on the Continent, a psychologist of the eminence of M. Ribot has treated the question of heredity under its sociological aspects, and the anthroposociological school associated with the names of Ammon and Vacher de Lapouge has endeavoured to apply Darwinian conceptions systematically to social evolution. Nor can the valuable works of Francis Galton, Ritchie, and Haycraft be overlooked. Although Galton's researches on the heredity of genius and similar problems were primarily undertaken from a purely biological standpoint, their repercussion on the domain of sociology was inevitable.

In the course of this work we shall endeavour to show the essential correlation of the two domains of biology and sociology, as seen not merely in the analogies between the life and development of organisms and the life and development of societies, so brilliantly and conclusively expounded by Spencer ; but also in the way in which the law of the survival of the fittest finds application in both. We shall find that selection plays a *rôle* in sociology no less important than it plays in biology ; we shall examine the

conditions of heredity, and see how the latest discoveries relating to hereditary transmission are applicable in the field of social evolution; and we shall test the truth of Spencer's dictum that there is no phenomenon in the world of social evolution that has not its root in the conditions of organic life in general.

Variability, heredity, excessive fecundity, and selection, are the four factors which Darwin recognised as the basis of his doctrine of descent. The co-operation of these four factors results in the evolution of living organisms, their progressive differentiation from a single original type and towards an ever higher level.

Variability is, in all probability, a property of every organism. In the whole realm of nature there are no two living beings exactly alike. We are, indeed, unable to penetrate into the world of microscopic organisms deeply enough to appreciate adequately the changes of structure or habit which occur there, but from the examples afforded us in the world of macro-organisms we are justified in concluding that variability is the universal rule. There is no valid reason for supposing that variability is absent in the simplest forms of life, or that its origin is coincident with the development of higher forms. The micro-organisms are subjected to the influence of their environment as much as macro-organisms; and no one at all aware of recent researches can doubt that even diminutive creatures such as bacteria are capable of varying greatly.

The distinctive marks by which we recognise and differentiate related species vary as a general rule within well-determined limits. Where it is possible to obtain definite calculations we usually find that fluctuating variations on either side of the mean are by far the most numerous, and those variations which break away from the normal type, either in a regressive or in an ascendant direction, are less numerous. But this is not a universal rule; there are both symmetrical and asymmetrical curves. Artificial breeding especially has disclosed cases like

that of a race of pigeons whose variation from the normal type has diverged to such an extent that the beak is too short and delicate to be able to break open the egg, and the breeder has to assist in the act of hatching.¹

In addition to the individual fluctuating variations, there are also sudden and far-reaching transformations which result, by a sudden bound, in a new specific type. The Dutch naturalist De Vries has especially insisted on these sudden transformations to which he has given the name of mutations, and which he distinguishes from the smaller and slower individual variations. According to De Vries, it is to mutation and not to individual variation that the transformation of species has been mainly due.

The *second* factor of evolution, according to the Darwinian doctrine, is that implied in reproduction itself—the factor of heredity. By heredity is to be understood the faculty possessed by an organism for transmitting its qualities, physical and psychical, to its offspring. All higher organisms possess a peculiar substance localised in the nucleus of the reproductive cell, which transmits the heritable qualities from parent to offspring. Heredity is concerned with those characters which are transmitted directly from the parents to the offspring, or with those qualities which offspring are capable of acquiring independently of their parents, but which, nevertheless, so permeate the transmitting substance that the next generation can inherit them directly. Thus many believe that an individually acquired *predisposition* to a disease may, as a predisposition, be transmitted to the next generation.

The *third* factor is that of excessive fecundity. “There is no exception,” wrote Darwin, “to the rule that every organic being naturally increases at so high a rate that, if not destroyed, the earth would soon be covered by the progeny of a single pair. Even slow-breeding man has doubled in twenty-five years, and

¹ Darwin, *The Origin of Species*, p. 106 (edition 1902).

at this rate in less than a thousand years there would literally not be standing-room for his progeny. Linnæus has calculated that if an annual plant produced only two seeds—and there is no plant so unproductive as this—and their seedlings next year produce two, and so on, then in twenty years there would be a million plants. The elephant is reckoned the slowest breeder of all known animals, and I have taken some pains to estimate its probable minimum rate of natural increase; it will be safest to assume that it begins breeding when thirty years old, and goes on breeding till ninety years old, bringing forth six young in the interval, and surviving till one hundred years old. If this be so, after a period of from 740 to 750 years there would be nearly 19,000,000 elephants alive, descended from the first pair.”¹

Given this enormous fecundity, it is evident that, unless Nature counteracts it by means of an equally enormous elimination, the number of organisms in the world would very soon be too great for the world to contain, for space, air, and food are limited. A definite and constant balance between the rate of multiplication and the rate of elimination must therefore be established. The total number of individuals of a species living in a given space is certainly subject to variation—in certain cases it is extremely variable—but we must, nevertheless, accept the fact that the *average* number of the members of a species remains constant. Otherwise, if the conditions remain the same, the species would be doomed to speedy annihilation. The number of deaths in a city during one year may be 50,000, in another year 45,000, in the third year 48,000. The total varies, but the average number of the inhabitants maintains itself, and must maintain itself if the city in question is not to disappear. Of course, if the conditions are greatly altered, greatly increased population may become possible and normal.

If we call the average numerical strength of a given species under given conditions the *normal number* of that species, the

¹ Darwin, *The Origin of Species*, pp. 79, 80 (edition 1902)

same will be determined by the number of progeny brought forth yearly, and the relation of that number to the number of deaths before maturity is reached. The fecundity of a given species being constant, its death-rate must needs be constant also, if the number of its members is, under given conditions, to remain the same. This relation of the death-rate to the fecundity-rate of a species explains why the normal number of that species remains constant. If we know the fecundity-rate of a species, we can calculate its death-rate; for, if the normal number of the species is to remain constant, only two offspring per pair can, on an average, reach maturity and reproduce, for otherwise the constancy of the normal figure of the species would no longer be maintained.

Thus, to take examples which Weismann has given us,¹ a pair of storks brings forth annually four offspring, and continues reproducing at the same rate for twenty years, thus begetting a total of eighty offspring. Of these eighty, only two can attain maturity and reproduce, while the other seventy-eight must be destroyed before attaining maturity. A trout lays yearly 600 eggs, and continues doing so during ten years. Out of the total of 6,000 eggs, 5,998 must be destroyed during development and youth, and only two can reach maturity. In other cases the death-rate is far greater. Certain worms bring forth no less than 100,000,000 eggs, of which 99,999,998 must be destroyed before maturity.

Thus a constant ratio is maintained between the fecundity rate and the death-rate of a species, and the maintenance of this ratio is essential if the normal number of that species is to remain constant. It may excite wonder that, given the constancy of this ratio, the fecundity-rate should be so excessively high; and yet, when we come to closer examination, we find that the enormous sum total of births is not superfluous, is not a mere

¹ A. Weismann, *Vorträge über Deszendenztheorie*, i. 39. Jena, 1904.

caprice of Nature. Take the case of the tape-worm, *Tænia solium*, which produces 100,000,000 eggs. In order that one of these eggs may be developed, it has to survive an astonishing number of risks. The joints of the tape-worm, laden with developing eggs, have to pass out of the human food-canal in which the adult tape-worm lives. The joints have to liberate the embryos by bursting, and the embryos have to be swallowed by a pig before they can develop further. The embryos liberated in the pig's stomach penetrate the wall of the food-canal, and bore their way into the muscles—it may be to some remote part of the pig's body. There the embryo goes through a further period of development, becoming a bladder-worm ; but, in order that the development may be completed, it is necessary that the pig should first die, and, finally, chance must so ordain matters that a piece of its flesh containing the bladder-worm is eaten by some mammal or by man. Only in the latter case, when the bladder-worm reaches the human intestine, will it be able to develop into a full-grown tape-worm. One can understand how extremely rarely all these vicissitudes are survived, and how necessary it is for the stability of the *Tænia* species that its fecundity-rate should be so enormously high.

A consideration of the excessive fecundity of all life brings us to the *fourth factor* in the Darwinian doctrine of descent—that of selection. When we consider the enormous death-rate throughout the whole range of species ; when we reflect that, out of the hundreds or thousands of progeny which may compose a family, on an average only two survive and reproduce ; the question must suggest itself, Does the survival of the two in question depend upon chance ? What mysterious mechanism is it which ordains that, on an average, only two of all these offspring survive ? And, to go further, why do the two which survive, survive ? Why not other two ?

Darwin has given the answer to these questions in terms of natural selection and its corollary, the survival of the fittest.

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Darwin has given the answer to these questions in terms of natural selection and its corollary, the survival of the fittest.

Out of the great number of organisms produced, only the fittest will survive and attain maturity and reproduce themselves—that is to say, those will survive which are best adapted to the conditions of the struggle for existence. Take Darwin's case of a wolf which preys on various animals, securing some by craft, some by strength, and some by fleetness, and suppose that the fleetest prey—a deer, for instance—had, from any change in the country, decreased in numbers, or that other prey had decreased in numbers, during the season of the year when the wolf was most pressed for food. Under such circumstances the swiftest and the subtlest wolves would have the best chance of surviving, and would thus be selected.¹ “It may be metaphorically said,” wrote Darwin, “that natural selection is daily and hourly scrutinizing, throughout the world, the slightest variations—rejecting those that are bad, preserving and adding up all that are good, silently and insensibly working, whenever and wherever opportunity offers, at the improvement of each organic being in relation to its organic and inorganic conditions of life.”

The struggle for existence is sometimes—indeed, frequently—indirect rather than direct. To take a hypothetical case, the hare, with its fur of mingled brown, white, yellow, and black, is well protected against its enemies by its coloration, which harmonizes with the colour of the bushes and herbage among which it takes refuge, and renders it less apt to be seen and recognised. Should snow fall, however, the colour of the hare would not only cease to be useful as a means of concealment, but would actually advertise its presence to its enemies, because of its contrast with the surrounding snow. Should, therefore, a severe winter with much snow set in, those hares whose fur had a greater proportion of white would be more likely to escape detection by their enemies, such as the fox, the badger, or the wild cat, than those with a darker fur. The white variety would survive, the dark

¹ *The Origin of Species*, p. 110.

variety would gradually be eliminated. On the other hand, the whiteness of the hare's fur would tend ever to increase, because, firstly, the mating of two white hares would be more frequent owing to the growing rarity of the dark variety ; and, secondly, because the "struggle" would resolve itself into one between hares of greater or less whiteness. And thus, ultimately, a race of exclusively pure white hares would arise, as is the case with the Arctic hare.

Variability, heredity, excessive fecundity, selection—these are the four factors whose co-operation has resulted in all the countless varieties which we find in the world of organic nature. Given the variability of all living organisms, given the power of hereditary transmission, and given the fact that a greater number of organisms are born than can, in the ordinary conditions of life, survive, it necessarily ensues that those alone will survive who are best adapted to their environment, who are best equipped for the struggle for existence. Natural selection, as Weismann says, is a process of self-regulation by which the persistence of a species is secured ; its result is the ever greater adaptation of the species to the conditions of life in which it is placed. Natural selection has produced an ever greater variety of organisms adapted to the endless variety of natural conditions, and also a never-ceasing progression and complication of organic types which form a long chain from the *Amœba* to Man.

Darwin remarks at the close of his monumental work that the laws which have produced all the infinite variety of forms are five in number : Growth and reproduction ; inheritance, which is implied in reproduction (we have combined these two laws) ; variability, due to the indirect and direct action of the conditions of life, and also to use and disuse ; a ratio of increase so high as to lead to a struggle for existence ; and, as a consequence, natural selection, entailing divergence of character and the elimination of the less fit forms. And he adds :

" Thus, from the war of nature, from famine and death, the

most exalted object which we are capable of conceiving—namely, the production of the higher animals—directly follows.”¹

Darwin still accepted, though with considerable hesitation, the Lamarckian theory of the transformation of organisms through the use or disuse of their organs. But the arguments of Weismann have shown us the fallacy of the Lamarckian theory, and we are compelled, in the light of recent biological research, to reject it.

The conclusion which we reach as a result of the Darwinian doctrine is that the co-operation of the four factors of variability, heredity, excessive fecundity, and natural selection, results in an ever greater perfection, in the form of an ever increasing adaptation to surrounding conditions. This progression, however, is not unconditional. We may divide the quality of progeny into three classes. The first of these classes is composed of those offspring who are superior in organisation to the parents; the second consists of those who remain on the same level with their parents; while the third is composed of those whose organisation is inferior, and marks retrogression. Should the first two types exclusively be permitted to reproduce themselves, the level of the species cannot fail to be raised in respect of quality; such is the case with all those species in which natural selection has not been wholly or partially superseded by a dominance of purely traditional factors. Should the third type be allowed a share in the reproduction of the species equal to the share of the two superior types, then a general retrogression and ultimate extinction of the species are inevitable. Man has reached his level at the summit of the world of organic life, thanks to the ceaseless and salutary process of natural selection. Should he persist in counteracting that natural selection by creating artificial conditions of life, then retrogression is inevitable, and the outcome of this is extinction.

¹ *The Origin of Species*, p. 669.

CHAPTER II

THE MECHANISM OF HEREDITY

A.—REPRODUCTION IN THE PROTOZOA AND SIMPLE METAZOA.

THE world of organic nature is divided into two great groups—the unicellular organisms (Protozoa and Protophyta) and the multicellular organisms (Metazoa and Metaphyta).

The Protozoa, or unicellular animals, differ from the multicellular animals not merely in the number of their component cells, but also in the relative absence of that differentiation which in the Metazoa is associated with the ever-increasing division of labour. Whereas the Protozoa are composed of one single cell, which serves for locomotion, digestion, excretion, reproduction, and all the other functions of this elementary life; the Metazoa, with the exception of their lowest forms, possess at least one general differentiation—that between reproductive and somatic cells. Among the lower forms of Metazoa a differentiation of the cells into reproductive and somatic is still incipient; but in most cases this fundamental differentiation is distinct between the cells of the soma, adapted to the maintenance and repair of individual life, and the reproductive cells, adapted to the continuance of the life of the species.

Among the simplest multicellulars we find some intermediate forms—often reckoned as Algæ—between the Protozoa and the higher forms of life. These simple multicellulars differ from the unicellulars only in the fact that they are composed of a large number of cells, for these cells are as yet wholly undiffer-

the millions of male cells which crowd round the ovum penetrates the nucleus of the latter. As soon as this successful spermatozoon has forced its way through the outer covering of the ovum into the nucleus, a thin membrane is formed, which, surrounding the ovum, effectually prevents the entrance of a second spermatozoon. The essential point in the process of reproduction is the conjugation or amphimixis of the nuclei of the two cells, of the ovum and spermatozoon.

The scientific researches of the last forty years of the nineteenth century have gradually disclosed the secrets of that mysterious process of fertilisation by which the continuity of by far the greater part of the animal world is secured. Though we are still far from understanding the ultimate secrets of reproduction, we are better able to appreciate its real nature. The farther research into this mysterious process penetrates, the more complicated does it appear, the more delicate and subtle the mechanism, not of fertilisation alone, but of the life of the cell in general. Formerly there was a general impression that the process of cell division, or karyokinesis, was a simple one, merely cutting in half the original cell. But although this "direct" division does indeed appear to occur in some rare cases, the process of division in the overwhelming majority of cells, and in almost all those which function actively, is exceedingly complicated.

In the first place, the nature of the cell nucleus is extraordinarily complex. We know that the nucleus not only includes a membrane and a nuclear fluid, but that in the state of repose a substance known as the "chromatin substance," and readily stainable with aniline dyes, is to be seen forming a sort of network within it. This chromatin substance is the most important histological element in the nucleus, for it alone is the vehicle of hereditary transmission. The dominant importance of the chromatin as the vehicle of hereditary transmission is proved by the part played by it in the process of cell division.

When the cell is ripe for division, the chromatin particles, which up till then have been distributed over the whole surface of the nucleus, approach each other, and unite in forming a long, thin chain, which is coiled in irregular fashion (Fig. 1, B). The chain seems to increase in volume, and one is able to see a little later that it has been divided into a number of pieces of equal length, each piece being composed, not of a continuous substance, but of a number of minute particles. The various pieces of the chromatin chain are known as "chromosomes," and their component particles as "chromomeres." The chromosomes become clearly separate, discrete bodies (Fig. 1, C), and there appears a so-called spindle—the apparatus for effecting the division of the cell (*sp*). Of great importance is a minute stainable particle (the centrosome), surrounded by a sort of halo or aster (centrosphere). The centrosome is generally regarded as an indispensable element in the process of cellular division—in fact, as being the dynamic centre, just as the chromatin is the heredity element. When a cell is ready for karyokinesis, the centrosome enters into activity, and undergoes a preliminary division, followed by that of its centrosphere. During the whole karyokinesis the centrosomes remain as centres from which the centrosphere irradiates the surrounding living matter like a sort of miniature sun. The two centrosomes separate farther and farther from each other, until they reach a position diametrically opposite one to another at the poles of the nucleus (Fig. 1, D). The resulting figure is known as the "karyokinetic figure," the poles being formed by the centrosomes and the equatorial plane by the chromosomes.

The significance of this karyokinetic figure is revealed by what follows. The chromosomes are seen to be divided into two rows, each row consisting of four chromosomes. The two rows now begin very gradually to break away from each other, drawing nearer and nearer to the two poles of the spindle (E and F). They reach the respective poles, and supply the material for the

formation of the two daughter nuclei ; and, indeed, these daughter nuclei do not take long in defining themselves, each group of chromosomes forming an enveloping membrane, and the chromatin substance distributing itself, as in the original nucleus, in a sort of network throughout the new nucleus (G).

Such is the process of cell division, as effective as it is wonderful. Its result is clear. By means of the karyokinesis the chromatin substance is divided into two perfectly equal halves, which go to form the nuclei of the two daughter cells. This fact alone, the extraordinary precision of the mechanism by which this equal division is effected, sufficiently proves the essential importance of the chromatin substance. As a result of the karyokinesis, half of the hereditary substance is transmitted to the one, half to the other daughter cell. The constant number of chromosomes which is maintained throughout all the cells of the body, the reduction of that number by half as a result of the so-called reducing divisions during the maturation of the germ-cells, justify the belief that the chromosomes are distinct physiological and morphological individualities. But the indispensable character of the chromosomes has been finally placed beyond doubt by microscopic vivisection experiments practised on unicellular organisms. These experiments have shown that Infusorians which are artificially halved are capable of reproducing the whole organism from either half, *provided that the half in question contains a piece of the nucleus, and not otherwise*. Thus it is certain that it is the nucleus which contains the matter capable of continuing the life of the cell, and, through the life of the cell, the life of the developed organism.

In the case of nearly all multicellular organisms reproduction is effected by means of a special germinal substance. The new individual is developed from a particular substance contained in particular cells—the reproductive or germ cells. This substance, which transmits from one generation to another those properties which combine to give the offspring the form and organisation

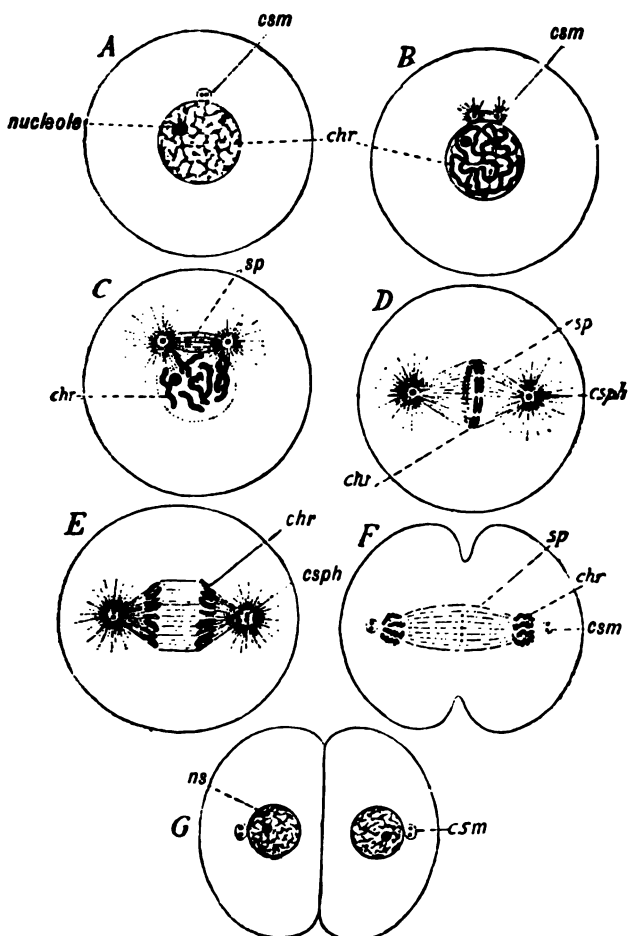


FIG. 1.—DIAGRAM OF KARYOKINESIS (AFTER WILSON).

(By permission of MR. EDWARD ARNOLD.)

A, Cell in state of rest (*csm* = centrosome). **B**, chromatin (*chr*) coiled in chain-like shape. Centrosome halved and surrounded by aster. **C**, spindle formed, nuclear membrane dissolving (*sp* = spindle; *chr* = chromosomes now distinct). **D**, karyokinetic figure (*csph* = centrospheres, forming poles). **E**, chromosomes definitely halved, aggregated at the poles. **F**, the new nuclei, after completion of karyokinesis (*ns* = nucleus; *csm* = centrosome).

of the parent, is the chromatic substance, or, as Weismann has called it, the *Keimplasma* or germ-plasm. It is always the vehicle of the hereditary qualities, no matter what the precise mode of reproduction may be.

It may be remarked that the nuclei of the egg-cell and of the sperm-cell have equal biogenetic value. It is a mistake to speak of the egg-cell as female, and of the sperm-cell as male. Each of these germ-cells has a complete equipment of chromosomes, and each *may* contain the centrosome which plays such an important part in the complicated process of karyokinesis. As a rule, however, it is the sperm-cell which imports its centrosome into the ovum. There is, however, no opposition or difference between the properties of the two cells, and the nucleus of the sperm-cell can take upon itself the rôle of the egg nucleus and *vice versa*. This fact has been demonstrated by Boveri's experiment on the egg of the sea-urchin. Boveri succeeded in separating the nucleus of an egg-cell from the surrounding protoplasm; he then artificially fecundated the denucleated egg-cell with the sperm of a male sea-urchin. The fertilised ovum—with a sperm nucleus only—proceeded to develop, the embryonic process pursued a normal course, and a larva was produced, capable of swimming freely. Weismann has concluded from this experiment that the nuclei of the two kinds of germ-cells are in every respect equivalent, and that each is complete in itself.

Before proceeding to consider the germ-plasm in more detail, we must glance at certain other phenomena presented by the process of fertilisation. It has now been ascertained that the phenomenon of fertilisation is essentially bound up with the blending of two nuclei. Fertilisation may, indeed, be described as the mingling of nuclei (amphimixis). A good example of such mixing is seen in the conjugation of unicellular organisms, in which it often happens that two individuals become one, just as the two germinal individualities or gametes—ovum and spermatozoon—in the Metazoa become very intimately one in ordinary

fertilisation. In both cases the process is a *decrease* in the number of individualities, as a preliminary to subsequent *increase*.

Professor Ischikawa, of Tokio, has given a very thorough description of the phenomenon of conjugation in the phosphorescent flagellate Protozoa known as *Noctiluca*. Two pin-head-like individuals unite for the purpose of conjugation. The protoplasm of the two cells is mingled; the nuclei, although not altogether blended one with another, form a single karyokinetic figure; a karyokinesis sets in, in the course of which the chromatic substance of the two conjugates is divided equally between the nuclei of the two daughter organisms. Finally, as a result of the karyokinesis, two distinct *Noctilucae* are formed. We see, therefore, that, although the phenomenon of conjugation results for a time in the diminution of the number of individuals, the ultimate result is their multiplication.

A remarkable phenomenon presented by all multicellular organisms, from the lowest to the highest, is the *maturation* of the germ-cells, which is accompanied by a reduction of the number of chromosomes to one-half of their original number. In the case of the egg-cell, the original germ-cell, through growth and the *doubling* of the number of its chromosomes, gives rise to the "ovocyte," or immature egg-cell (Fig. 2, B). This ovocyte goes through two successive divisions. The result of the first division is to divide the number of chromosomes into equal halves. Thus, if we take four chromosomes as the normal number for a given species, and suppose that number to have been doubled in the course of the development of the original germ-cell, we find that four chromosomes are, as a result of this first division, ejected from the cell, so to speak. These four chromosomes form the first "polar body," lying against the exterior wall of the cell (Fig. 2, D, *pg*). The remaining half of the chromosomes lie juxtaposed to the polar body, but within the cell, forming a reduced nucleus. By a second division this

nucleus is again halved, two additional chromosomes being ejected, and forming the second polar body (E). Meanwhile the first polar body divides into two, each with two chromosomes. Thus there are eventually four nuclei produced from the original

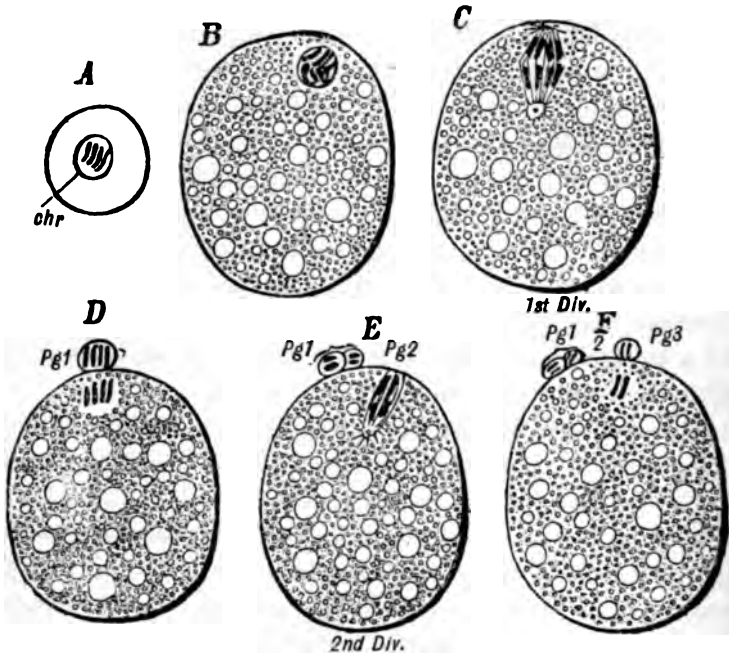


FIG. 2.—MATURATION OF OVUM OR EGG-CELL (AFTER WEISMANN).

(By permission of MR. EDWARD ARNOLD.)

- A, The primitive germ-cell (*chr* = chromosomes). B, the ovocyte, with doubled chromosomes. C, first karyokinesis. D, immediately afterwards, half the chromosomes (4) in the first polar body (*pg*). E, second karyokinesis, first polar body (*pg*) divided, nucleus effecting new division. F, the mature ovum, with two chromosomes; three polar bodies outside the cell.

ovocyte—namely, three polar bodies and the reduced nucleus of the ovum—and each of the four nuclei has two chromosomes—half the normal number.

The chief interest of this complicated maturation process

centres in the chromosomes. The doubling of their number during the development of the primitive germ-cell is very remarkable. The reason for it may be found, as Weismann has suggested, in the fact that it enables the number of variations produced by amphimixis, or the mingling of the parental elements, to be enormously increased. The successive divisions preceding maturation would, in the event of the number of chromosomes not being doubled, have the effect of reducing the chromosomes to one-fourth of the normal number possessed by the species. As it is, the possible combinations of the chromosomes are very greatly increased through the doubling which precedes their ultimate reduction; for it must be observed that the next result of maturation, as far as the chromosomes are concerned, is their reduction by half. Thus, in the hypothetical case before us, the number of chromosomes in the original germ-cell is four; after the maturation the ovum contains but two (Fig. 2, F).

As for the polar bodies which are "expelled," so to speak, from the egg-cell during its maturation, there seems little doubt that they are *abortive ova*, incapable of attracting the sperm-cell, and destined only to disappear. The difference between the maturation of the sperm-cell and that of the ovum is that, whereas the four spermatozoa which result from the successive divisions of the spermatocyte (corresponding to the ovocyte) remain complete, and potentially capable of fertilising the egg, three of the products of the ovocyte are eliminated in the form of polar bodies, and only one—the mature ovum—is capable of development. The reason for the impotency and essential disappearance of the polar bodies is to be found in the fact that they lack the protoplasmic substance necessary to maintain life.

The process of maturation in the case of the spermatozoon is much the same as in that of the ovum. The primitive germ-cell goes through a period of growth, and develops into the spermatocyte. During this development the number of chromosomes is doubled. The spermatocyte then undergoes two successive

divisions (Fig. 3, C, E). The result of the two divisions is the formation of four spermatozoa of equal size and equal capacities, each one of which contains half the number of chromosomes found in the original germ-cell.

In the case of parthenogenetic eggs there is usually only one maturation division. The reason for this is not hard to find.

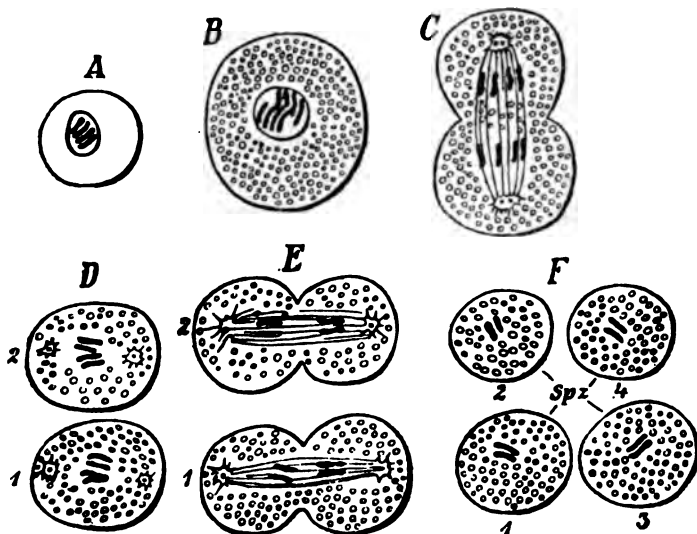


FIG. 3.—MATURATION OF SPERMATOZOID (AFTER WEISMANN).

(By permission of Mr. EDWARD ARNOLD.)

A, Primitive germ-cell, with nucleus. B, spermatocyte. C, the first karyokinesis. D, result of first karyokinesis. E, the second karyokinesis. F, four spermatozoa of equal size, matured (*Spz*=Spermatozoa).

The parthenogenetic egg has to retain, not only the hereditary substance of the ovocyte, but also the equivalent of the spermatozoon, in view of the fact that it undergoes no fertilisation.

It is time now to say a word concerning the phenomenon of fertilisation, or amphimixis, which plays so important a rôle in the animal world. The very fact that fertilisation, or amphi-

mixis, is of such wide occurrence as to be almost synonymous with reproduction itself, is sufficient proof of its importance. Amphimixis consists in the mingling of the two parental elements in reproduction ; and as we have seen that the elements necessary to generation are contained in the nuclei of the ovum and spermatozoon respectively, amphimixis is a phenomenon of nuclear blending.

As conducive to amphimixis, we must first of all notice the differentiation of the reproductive cells into male and female. Such differentiation does not seem to affect the fundamental organisation either of the egg or the sperm cell, as is borne out by Boveri's experiment already mentioned. Sexual differentiation would appear to be merely an adaptation which facilitates the mingling of the germinal substance of the two reproductive cells. This mingling is brought about by the chemiotrophic attraction exerted by the egg-cell. The structure of the two cells bears out this view. The spermatozoon is small—immeasurably smaller than the ovum—but it possesses greater facility of movement, while the relative immobility of the ovum is compensated for by the fact that it contains that cytoplasmic substance essential to the maintenance of the life of both cells. And while the ovum furnishes the nutritive matter for both, the spermatozoon, by introducing a new centrosome into the egg, enables the latter to develop by fission ; for the centrosome of the ovum, in the majority of species, disappears more or less completely in the course of the egg's maturation. Thus both kinds of germ-cells are essential, and each completes the other, the egg furnishing the nutritive capital, and the spermatozoon the dynamic centre of the karyokinetic process.¹

The conception which formerly prevailed concerning amphimixis, and which certain experiments of Maupas on Infusorians seemed to confirm, was that amphimixis afforded a sort of "reviving force" by means of which life was perpetually rejuvene-

¹ Boveri, *Das Problem der Befruchtung*, pp. 32 ff. Jena, 1902.

nated. Maupas, in his experiments, demonstrated that certain Infusorians, when artificially prevented from conjugating, die out. The death of the colony is slow, but sure, and Maupas had no hesitation in ascribing it to senile decay; for, when the artificially imposed conditions were removed, and when conjugation set in again, the degeneration was effectually prevented, and the colony was "rejuvenated." Maupas himself described the phenomenon of conjugation as *un rajeunissement karyogamique*.

The experiments of Maupas are not, however, as conclusive as their author supposed them to be. Weismann has suggested that it may very likely have been the unnatural conditions under which Maupas maintained his colony during several months, rather than the lack of conjugation, which caused their ultimate decay and death. Weismann has himself experimented with a parthenogenetic species of crustacean, *Cypris reptans*, and during sixteen years he was able to breed over eighty successive generations without any amphimixis. Weismann rightly remarks that the alleged "rejuvenating" force of some former amphimixis must, in this case, have been an extraordinarily persistent one.¹

The truth is that amphimixis, *in the case of those species which practise it*, is an indispensable condition of development and reproduction. Although asexual reproduction may continue for a certain time, sooner or later amphimixis must again intervene. But it is essentially a phenomenon *sui generis*. That it is not universally indispensable to reproduction is proved by several instances. A large number of Algæ and Fungi are developed exclusively from asexual spores, and the occurrence of parthenogenetic eggs proves that even differentiated female reproductive cells can, under certain circumstances, develop independently of amphimixis. Certain crustacea reproduce themselves solely by parthenogenesis, and this is the more interesting, since it is known that they formerly exhibited sexual reproduction, for the

¹ Weismann, *Vorträge über Deszendenztheorie*, i. 267.

pouch which used to serve for the reception of the spermatozoa still persists, though it is invariably empty.

In what sense, then, it may be asked, can amphimixis be regarded as a condition of the continuation of life? The reply is that, *in the case of those species which reproduce by amphimixis*, the conditions of reproduction are such that the germ-cells of the two sexes are incapable of development by themselves, and that amphimixis, by bringing about a fusion of these elements, permits their subsequent development. We have already noticed how the egg and the sperm-cell complete each other. The egg, in order to be ripe for fertilisation, must pass through certain changes. These include the loss—or, at all events, the degeneration—of the centrosome, and the entrance of the spermatozoon in amphimixis can alone remedy the deficiency and enable the egg to develop. Here, therefore, amphimixis appears as an indispensable condition for the continuance of the life of the species. But even this is not absolutely true. The egg can obviate the apparent necessity of amphimixis by undergoing only a part of the changes involved in maturation. This is well illustrated in artificial parthenogenesis.

The remarkable experiments of Tichomiroff and Loeb have shown that, when certain ova are subjected for a short time to the influence of sulphuric acid or to sea-water with some magnesium chloride added to it, parthenogenetic development may ensue. It seems as if the degeneration of the centrosome of the egg can be thus counteracted. In short, the influence of various kinds of chemical reagents artificially introduced may have the same result as amphimixis, as far as the division of the egg and the development of a larva are concerned.¹

¹ The observations of Petrunkevitch have confirmed the supposition that the effect of artificial parthenogenesis in the sea-urchin is to prevent the dissolution of the centrosome of the egg. It is not a new centrosome which is formed, but the original persists, in a sense, "strengthened" by the aid of the artificially-introduced salts (*vide* report in *Zoologische Jahrbücher*, Supplementsband vii., Jena, 1904).

C.—THE GERM-PLASM.

Since the great impetus given to scientific research by the work of Darwin, numerous theories have been advanced to facilitate an explanation of the phenomena of inheritance and development.¹ We have had the gemmules of Darwin, the idioplasm of Nägeli, the plastidular perigenesis of Haeckel, the determinants of Weismann, the catagenesis of Cope, the intracellular pangensis of De Vries. Of all these theories, the one which is most in harmony with the facts, the one which seems most likely to survive—not without modifications, perhaps, but in all its fundamental ideas—is the germ-plasm theory of Weismann. The monumental work of Weismann bears the impress of an original and powerful intellect. It is a brilliant construction, consistently thought out, and cleverly adjusted to the facts of which it affords a logical explanation.

The germ-plasm, according to Weismann, is that substance by means of which the capacity for development and reproduction possessed by an organism is handed on to the offspring. It is the hereditary substance, the vehicle for hereditary transmission, the substance by means of which the continuity of life is secured. Nägeli, before Weismann, had recognised that there are two great kinds of living substance—hereditary substance, or idioplasm; and “nutritive” substance, or trophoplasm; and Nägeli had further expressed the view that the former was

¹ Some of the chief works on the subject are those of Darwin, *The Descent of Man* (1st edition, 1871); *Pangensis*, in *Nature*, iii., No. 78 (1871). H. Spencer, *The Principles of Biology*, 2 vols. E. Haeckel, *Generelle Morphologie*, 1866; *Die Perigenesis der Plastidule* (Berlin, 1876). F. Galton, *Hereditary Genius* (edition 1892); *Pangensis*, in *Nature*, iv., No. 56 (1871). Nägeli, *Mechanisch-physiologische Theorie der Abstammungslehre* (1884). P. Geddes and J. A. Thomson, *The Evolution of Sex* (1889). A. Weismann, *Das Keimplasma* (1892); *Vorträge über Deszendenztheorie*, 2 vols. (1902). Delage, *L'Hérédité et les grands Problèmes de la Biologie générale* (1895).

quantitatively much inferior to the latter. Nägeli's conception of the nature of the idioplasm differs somewhat from Weismann's conception of the nature of the germ-plasm, but the idea of two distinct kinds of living substance is common to both. Weismann distinguishes the two as germ-plasm and somatoplasm.

The conception at the basis of Weismann's theory is that of the continuity of the germ-plasm. The germ-plasm, like the Protozoa, is immortal. It does not die with the life of the individual, but is continued in an unending chain from one generation to another. When we speak of immortality in connection with the germ-plasm, or in connection with the Protozoa, the word must not be taken in any metaphorical sense. The unicellular organisms do not succumb to the "wear and tear" of life, to natural death, as the higher organisms do. Having reached a certain limit of growth, beyond which they cannot go without dividing, they divide. The two halves separate as independent units, and go through a similar process of growth and division, and so on for an unlimited time. Unicellular organisms are, therefore, potentially immortal—that is to say, they do not cease to exist as a result of *natural* death. There is no such thing as natural death among the Protozoa.

It is essentially the same with the germ-plasm. The simple fact that the excision of the genital organs prevents the individual on which it is practised from reproducing itself, and reduces it to sterility, shows that the germ-plasm cannot be made afresh from somatoplasm; and it shows also that certain cells only are capable of reproduction, are capable, consequently, of containing germ-plasm *in an inactive condition*.

For the germ-plasm is present in every organism in two forms—active and inactive. Active germ-plasm is that part of the germ-plasm which goes to build up the bodily frame or soma of the individual. For this reason it is called "somatic idioplasm." It is that portion of the germ-plasm set apart for individual

development or ontogenesis, and for ontogenesis alone. Each cell of the body contains germ-plasm in an active condition ; but this active germ-plasm, though enabling the body-cell to reproduce *itself*, is not present in sufficient strength to enable the somatic cell to reproduce the whole body. Active germ-plasm, adapted to the needs of the individual development, and located in the soma, dies with the soma. Inactive germ-plasm, on the contrary, adapted to the maintenance of the race, and located solely in the cells of the reproductive organs, is transmitted from one generation to another, and guarantees the stability of the racial history or phylogeny.

Thus every organism may be said to be born with a store of germ-plasm in two forms. The active germ-plasm of the embryo presides, metaphorically speaking, over the building up of the body-frame ; it passes into every cell of the body, bequeathing to each its capacity of organisation and development. The inactive germ-plasm is a reserve substance, subjected solely to the quantitative changes of growth. It remains in the germ-cells, is adapted to the reproduction of the species, and it is necessarily endowed with potential immortality.

We have seen that the hereditary substance of germ-plasm is located in the cell nucleus, and we have seen that the extraordinary precision of the movements of the chromosomes during karyokinesis and during the process of maturation, justifies our conclusion that the germ-plasm is located in the chromosomes.

- The chromosomes, or ids, constitute the entire germ-plasm of the nucleus. These ids do not form a homogeneous substance. On the contrary, it is supposed that each id is formed by a number of autonomous living units—the determinants, so called because each determinant, or each group of determinants, *determines* the structure, organisation, and composition of a corresponding cell or group of cells in the fully formed organism. But the determinants are not the ultimate vital units. The determinants themselves must have a complex nature, and are supposed to

be formed of a number of living particles known as biophors. The biophors are the ultimate units of organic matter. Their existence is, indeed, hypothetical, but it is a necessary hypothesis; for, as no single molecule of inert matter¹ can of itself determine life, we must suppose a peculiar and complex combination of molecules which go to form the living biophor. Biophors, determinants, and ids constitute, therefore, what we may call the organic hierarchy.

Before entering into more details concerning the rôle of the determinants, it may be useful to glance at the question of the origin of the germ-cells in the developmental process. According to Weismann, the germ-cells do not always arise at the end, but sometimes at the beginning of the embryogenesis, at the same time as the somatic cells. In the Daphnids, the germ-cells are distinguishable in the segmented egg itself, whereas in the case of the human species they are not distinguishable until the process of embryonic development. In cases like the last, the continuity between the parental germ-plasm and that of the offspring can only be established through a lineage of successive somatic cells, which contain, along with active germ-plasm, or somatic idioplasm, a reserve of inactive germ-plasm. The line of continuity which is thus established between the parental germ-plasm and the differentiated germ-cells of the offspring is known as the "germinal tract" (*Keimbahn*). Observations on *Hydromedusæ* have shown that only a well-defined lineage of cells is capable of thus transmitting the reserve of inactive germ-plasm.

While the inactive germ-plasm, the vehicle of heredity, remains unaltered structurally during the life of the individual, the active germ-plasm, located in the body, is used up in the ontogenesis. The function of the active germ-plasm is the

¹ Inert matter is not an altogether accurate expression. The curious "brownian movements" and other phenomena make it probable that inorganic bodies are potentially as mobile as organic ones; the difference is probably merely quantitative.

transmission to each cell, or each group of cells, of those properties by means of which the appropriate organisation, structure, and composition are effected. Its function is, consequently, the *determining of the soma*. We have seen how the germ-plasm is organised in order to fulfil this function. Biophors, determinants, ids, are arranged within it in complex architecture, different for each species. How, then, does the germ-plasm determine the somatic cells ?

The reply is : Through the distribution of the ids in the process of development. The ids contained in the cell nucleus break up into groups of component determinants, into dissimilar groups produced by unequal division of the ids. We shall see the reason for this unequal division shortly. The determinants in turn break up into their component biophors ; the biophors are distributed to the various cells, and determine the function and form of these cells.

Each determinant, or group of determinants, stands in definite relation to definite cells or groups of cells in the fully formed organism ; that is to say, a given part of the animal is determined, both as regards its existence and as regards its nature, by a corresponding part of the germ-plasm—i.e., by a corresponding determinant or group of determinants. Thus the cells of an organ X are determined by the determinant X^1 , alike in their existence and in their nature ; the cells of an organ Y by the determinant Y^1 , etc. That part of the organism which is determined by a given determinant is known as the “determinate.”

The determinants of two corresponding organs in the same individual, or the determinants of the same organ in two different individuals, are homologous with one another. Thus the determinants of the right hand are homologous with the determinants of the left, and the determinants which in one parent correspond to a given determinate X are homologous with those determinants which in the other parent correspond

to the same determinate X. Homologous determinants may be either homodynamic or heterodynamic in their nature. Homodynamic determinants are those which are quite identical with each other. Heterodynamic determinants, on the other hand, are those which have an *ultimate* or general identity, but whose properties have no *immediate* identity. Thus, if we pair two pigeons, and suppose the feathers on the wings of the one to be pure white, the feathers on the wings of the other to be white mingled with blue, the determinants of the purely white feathers are said to be homodynamic with one another, both their immediate identity (colour of the feathers) and their ultimate identity (structure and composition) being obvious. On the other hand, the determinants of the mingled white and blue feathers are heterodynamic; for, although the ultimate result of their co-ordination be the same wing, there are differences which manifest themselves in the varying of the colours.

The composition of the germ-plasm, which we have just outlined, presupposes the existence of determinants as morphological and physiological units—as living units, in a word. M. Yves Delage, in his great work on heredity, has maintained that the theory of determinants assumes a too complicated composition for the germinal substance, and he inclines to the view that the germinal substance is extremely simple in its nature. But, even if we pass over the fact that the protoplasm of the *Amœba*, which is one of the most elementary forms of life, is already very complicated in its nature; we find that M. Delage ascribes properties to the germinal substance which are difficult to reconcile with his assumption of the simplicity of that substance. Thus he grants that the different groups of cells of the living organism, such as those of the muscles or the glands, are contained *in potentia* in the parental germinal substance; but this is equivalent to postulating a system of determinants. And if the determinants are not living autonomous units, but simply particles of protoplasm, how can they resist the assimilating

influence of the surrounding protoplasm? Determinants must be units capable of assimilation and reproduction.

Determinants must also be autonomous—that is to say, a determinant or group of determinants must be able to modify a given determinate of the organism without modifying the whole. The case of those individuals who have one small tuft of white hair amongst a mass of dark hair is an example of this. The determinant of this tuft of white hair may be eliminated in the course of generations, and the determinate—the tuft of white hair itself—disappears accordingly from the soma; but the rest of the organism is not in any way affected by this change.

If the determinants, during the process of development, resolve themselves into their component units, the biophors, and penetrate in this way into the cells which they are to determine, then the id must have the faculty of dividing into similar, and also into dissimilar, parts; it must be able to produce daughter ids which are homodynamic, and other daughter ids which are heterodynamic—that is to say, it must be able to produce ids containing determinants differing in character. The first type of id division is called *integral* division; the second type is called *differential*. A differential division of the id is not directly demonstrable; we become aware of it only in its somatic results, in the different *rôle* which different cells play in the ontogenesis. For instance, when two sister cells in the embryo give rise, one to the endoderm, the other to the ectoderm, we must conclude that the primitive cell has *differentiated* its germinal substance, and that in the division that germinal substance has been divided in a dissimilar fashion between the daughter cells, one of which produces the ectoderm, from which the epidermis and the nervous system are developed, while the other produces the endoderm, from which the food-canal and its outgrowths arise. Differential karyokinesis will take place in every case in which a cell is divided into two daughter cells having a dissimilar or

differentiated destiny in the process of development. The blastomeres which develop the endodermic system must necessarily have a different prospective value from the blastomeres which develop the ectoderm.

We must also suppose that the determinants exist in two states—active and passive. These states are to be understood as relating to the mode of action which a determinant may exert on the cell in which it lies. During the period in which they are in a passive state the determinants increase by growth, but do not influence the development of the cell. They may, indeed, for instance, remain so passive that they never express themselves except in peculiar and unusual conditions, constituting a reserve of determinants which become active in regenerating a lost part.

It may be asked, then, if the determinants are pre-adapted to the particular cells which they are to determine? Whether the biophors which compose them are, for instance, muscle biophors or gland biophors? Whether the plant derives its capacity of producing chlorophyll from chlorophyll biophors? It is evident that the biophors, which have the power of transforming an undifferentiated embryonic cell into a highly differentiated tissue-cell, must possess a specific nature of infinite complexity; but it should be noted that it is not the biophor *alone* which is capable of producing a muscle-cell or a gland-cell: it is rather the biophor, in conjunction with the given elements of the cell, which produces the differentiated cell, with its muscle substance or gland substance or chlorophyll substance. But the biophor, which is the vehicle of the capacity of forming a muscle-cell or a chlorophyll cell identical to the muscle-cell or to the chlorophyll cell of the preceding generation, must certainly possess a specific and well-defined structure which differentiates it from the other biophors, and enables it to secure the continuity of the particular quality which it bears.

In connection with the liberation of the determinants, we must

say a few words concerning the source from which the determinant energy is derived. We have seen that a distribution of the ids takes place during the development ; that the id resolves itself into its determinants, and the determinants into their biophors ; and that the biophors penetrate into the various cells to which they stand in definite relation, and that they determine the structure and function of those cells. Weismann has concluded that the developmental distribution of the ids takes place along lines prescribed by the vital affinities of the biophors. These vital affinities constitute a sum of forces between the determinants which bind the latter together in the id, and which give to the id the properties of assimilation and multiplication. Vital affinities in the organic world correspond to the chemical affinities of the inorganic world. A molecule of inorganic matter cannot multiply itself by division. In the case of an inorganic molecule—*e.g.*, of salt—division would mean the loss of those properties which, by their combination, had produced the salt molecule. It is characteristic of the living molecule, the biophor, that it possesses the capacity of assimilation, growth, and multiplication by division, for the biophor is the elementary living particle. We see the action of the vital affinities of the biophors, consequently those of the determinants and the ids, during the process of karyokinesis, in which the chromosomes in each successive division are divided exactly into two halves ; a division the accuracy of which is not determined by exterior forces, but by purely internal ones.

The same vital affinities which unite the biophors in the determinant, the determinants in the id ; which enable these living elements to assimilate, grow, and multiply ; and which produce the exact division of the chromosomes in the karyokinesis, preside also over the distribution of the ids and the determinants in the process of development.

But the germ is composed, not of a single id, but of many. The number of chromosomes or idants, each composed of many

ids, differs with the species. The human species is said to have sixteen chromosomes in each nucleus, while certain crustaceans have as many as 168. Each id contains in itself *all* the properties of the organism, but the nature of the organism is always decided by the *complete complement of ids*—that is, by the organisation of the chromosomes. As a result of the mingling of the parental elements in amphimixis the ids are of a heterogeneous nature, and we see that a vast number of combinations are rendered possible by amphimixis.

Through the mechanism of cell division during the embryonic development—a mechanism ultimately referable to the vital affinities of the biophors—homologous portions of each id (homologous, yet composed of different types of determinants) penetrate into every cell. The general nature of every cellular type that arises in the course of the development is thus determined by an id complex, or rather by a complex of individually different determinants, which resolve themselves into their biophors. The precise histological character of the cell is, however, determined by *one single type of determinant*; the other determinants contained in the cell remain inactive. The resolution of the determinants into their component biophors, and their penetration into the cells, is determined by the internal conditions of the determinants—that is to say, by their vital affinities, which depend also in a large measure on the conditions of intracellular nutrition. But there is another factor which also plays a part in the “liberation” of the determinants—namely, the specific attraction between a particular determinant and a particular cell. Cases in which two sorts of homologous determinants are present in a single cell—as we must conclude from such phenomena as regeneration and polymorphism—compel us to accept this hypothesis.

In 1881 Wilhelm Roux expounded the fruitful conception of a struggle of parts within the organism, or what we may call histonal selection, the fundamental idea of which is that each

organ possesses a specific activity, a measure of what might be called self-assertiveness in relation to other parts.¹ In the case of an organ undergoing hypertrophy, the loss caused by dissimilation is *over-compensated for* by the energetic influence of the organ's specific activity. There is a qualitative regulation of the organ by the organ itself; in other words, the stimulating and assimilative energies due to the specific activity of an organ can over-compensate for the results of processes of dissimilation. From the conception of a specific force in each organ Roux derived his theory of the "struggle between the parts" (*Kampf der Teile*). For instance, if differentiated functional stimuli are affecting the embryonic cells of different physiological properties, A, B, and C, that cell which is most violently acted upon by the stimulus appropriate to it—we suppose the stimuli A¹, B¹, C¹ to be in appropriate relation to A, B, and C respectively—will increase in development most rapidly. The proportion in which the cells A, B, C will subsequently stand to each other in the finished tissue will depend upon the degree of stimulation which the specific stimuli A¹, B¹, C¹ have respectively exercised. This is what Wilhelm Roux called "the struggle between the parts."

Applying Roux's suggestion, not to the cells only, but to the component parts of the cell, the determinants, we find that the histological character of a given cell A will be determined by the degree of stimulation which the specific stimuli of the determinants within it are capable of exercising. The character of that cell will be determined by a single determinant, and that determinant will be called into action by the preponderance of its specific excitability in relation to the cell.

Cases where two homologous determinants are present in a single cell illustrate still more clearly the results of the action of specific excitatory forces. Why, indeed, should one of these homologous determinants develop into activity, while the other

¹ W. Roux, *Der Kampf der Teile im Organismus*. Leipzig, 1881.

remains inactive, if it were not that the specific excitation A^1 , corresponding to the determinant A, exercises a greater influence on the cell than the specific excitation B^1 , corresponding to determinant B? The nature of this specific stimulus we do not know, just as we do not know the intricate nature of the nutritive changes in metabolism. But what else could explain, for instance, the phenomenon of sexual dimorphism? The existence, not only of primary, but also of secondary sexual characters, compels us to accept the hypothesis of the presence of two sets of determinants in the germ-plasm. We know that even so subtle a character as the soprano voice of a woman can be handed down through the son to the grand-daughter. Obviously, then, it must have remained in an inactive or latent condition in the germ-plasm of the son. In the case of certain animals, such as the Aphides and the Daphnids, females only are produced for numerous generations in succession; and the determinants of the male sex must remain inactive throughout these generations, for they develop into activity after a certain time, and a male is born. What is this renewed activity of the male determinants after so many generations of inactivity but a re-assertion of their specific excitatory force?

We come now to the question of the number of the determinants. Are the determinants in some cases identical with the biophors, which in other cases go to make up the determinant? In the case of very simple organisms this identity may obtain, but it is not general. The determinants may be defined as particles of the germinal substance which determine the function and structure of every part of the body that is capable of independent variation and inheritance. In other words, it is the pressure of specific determinants in the germ-plasm that determines the definition of a cell or group of cells in a specific manner. As to the number in which such determinants are present in the organism, this will depend on the degree of complexity which the organism exhibits. In the case

of the Protozoa, the number of the determinants will probably be considerable ; for, although we are unable, with our present means of observation, to detect the autonomous variation of the cell organs in the Protozoa, we must conclude that the Infusorians, for instance, possess variable cell organs. In the case of the higher Metazoa, including man, the number of determinants must be very large ; for in the organism of the higher animals everything is specialised, and can only be changed by means of autonomous variation in the germinal substance. There are many cases, however, of structures of identical nature—for instance, the hair on the bodies of mammals, or the scales on the wing of the butterfly—of which it cannot be said that every hair or every scale is capable of independent variation. On the contrary, it is rather certain areas, so to speak, which can vary independently, and then we may say that the hairs or scales of that area are determined in the germ-plasm by a single determinant.

To sum up, the germ-plasm or hereditary substance of all multicellular organisms is composed of a number of chromosomes or idants (groups of ids), whose number varies according to the species, but is constant for each species. Each id contains the sum total of the features, characteristics, and dispositions of the individual in the shape of a number of determinants, each one of which stands in precise and well-defined relation to some hereditary variable part of the organism. Each kind of determinant is contained in the germ-plasm as many times as there are ids in that germ-plasm. Each determinant possesses a well-defined structure, and is composed of a mass of differentiated biophors, or elementary living particles, capable of growth and of reproduction by division.

NOTE ON BOVERI'S EXPERIMENT ON THE EGG OF THE SEA-URCHIN.

Weismann has expressed the opinion that the combination of the two sperm nuclei would be capable of producing the same results as the combination of an ovum nucleus and a sperm nucleus, and has based his opinion on Boveri's experiment on the egg of the sea-urchin. Weismann's view is probably correct, and in any case we may safely affirm that the sperm nucleus is able to *replace* the ovum nucleus. It is probable that in Boveri's experiment only a single sperm nucleus was in activity. The possibility of the sperm nucleus fecundating the denucleated ovum is consistent with what we have already concluded—that there is no organic difference, but rather organic identity, between the spermatozoon and the ovum. The spermatozoon cannot survive independently of the egg, because it lacks nutritive substance. On the other hand, the egg either lacks a centrosome as the result of the changes which occur in maturation, or else its centrosome is in a state of degeneration. Seeing that the spermatozoon possesses a centrosome and all the essential properties of the ovum and that the cytoplasm of the denucleated ovum is at its disposal, there would be reason for surprise if the result of Boveri's experiment had been other than it was.

NOTE CONCERNING THE DETERMINANTS.

It must be observed that external conditions have also an influence on the determinants. The determinants are, as we have seen, living unities, and consequently they respond differently to different stimuli. Thus, under normal conditions, the determinant produces a normal determinate; but under abnormal conditions, in so far as these do not exclude all possibility of development, the determinant will produce an abnormal determinate. The experiments of Herbst on the egg of the sea-urchin have shown that when certain components of the sea-water are replaced by other chemical substances, the structure of the larva differs profoundly from the normal condition. It must not be forgotten that the great majority of the finished parts of an organism are not determined by a single determinant, but by all the determinant complexes which have formed, during the developmental process, the many cells which share in the biogenetic history of a given part. There are no special determinants of an aquiline or a hooked nose, but many determinant complexes shared in forming the various cells which led up to the development of the nose in the finished organism; and these successive complexes of determinants have so formed

the successive embryonic cells that the crooked or the aquiline nose was bound to be the ultimate product of their co-operative development. Thus it is with the whole organism : the whole of the nervous system, the vascular system, the glands, the muscles, the digestive apparatus, the reproductive organs, all are determined by the intervention of successive determinant complexes during the embryonic development. The modification of the organ, or system of organs, through the intervention of one kind of determinants, to the exclusion, or partial exclusion, of the rest, is a modification due, in the ultimate instance, we have seen, to the preponderance of the specific excitation pertaining to those particular determinants.

CHAPTER III

GERMINAL SELECTION

To try to grasp the precise nature of the ordering of the determinants in the germ-plasm is a hopeless task. But it is not to be supposed that the determinants are located in the germ as they are subsequently located in the fully formed organism. Many groups of cells combine during the course of the embryonic development, and co-ordinate their activities in the formation of an organ, which originally possessed no co-ordination. The ordering of the determinants in the germ-plasm need not correspond to their subsequent ordering in the developed organism, for the finished organism is not preformed in the germ, but merely predestinated.

If we observe the development of the limbs of those insects which, in their larval phase, possess neither legs nor wings, we find that during the larval period the limbs gradually develop under the skin. In this case some definite little groups of cells in the skin determine the formation of the limbs, and this group of cells is the most important factor in the development of the limbs. This cell group does not, however, determine the entire leg of the insect, but only the hypodermis. The internal parts of the leg, the nerves, tendons, and muscles, have their origin in other groups of cells. It is the same with all organs of complicated structure; they are formed by the collaboration of the forces of a number of different determinants, some of which define one part, others another part, of the organ in question.

This co-ordination of determining forces essentially involves a combination of internal and external influences. Cells from

which there proceed in the long run the blood-vessels, or the tendons, or the nerves of an organ, need not necessarily be determined in such a fashion that they contain *in potentia* all the elements of the blood-vessel, or the sinew, or the nerve. It may well happen that the embryonic cell possesses nothing more than a general tendency to determine a given morphological determinate; while the shape and structure of this determinate depends on the environment in which, in each specific case, it may find itself. For instance, we find nerves and blood-vessels located in certain pathological tumours, which were certainly not originally determined in the form in which we see them; they have been produced by the pressure and specific attraction of the pathological basis which underlies the tumour; and their original determinants simply possessed the property of producing, under certain circumstances, blood-vessels or nerves in general.

These preliminary remarks are intended to show that the theory of the "predestination" of the organism in the germ-plasm is not to be confounded with the old theory of "preformation" associated with the name of Bonnet. Epigenesis is not by any means irreconcilable with the doctrine of the germ-plasm. Weismann has merely, if we understand him rightly, gone behind the theory of Wolff. The organism in its finished state is certainly the result of epigenetic development, of a series of successive developmental stages emerging from the primitive germ-cell. But the germ-plasm contains in itself the *predispositions* of all the parts of the finished organism; it contains, not the miniature picture of which a given organ is the enlarged result, but a mass of determinants which possess the property, in conjunction with the given elements of the different cells, of *determining* the structure and existence of the several parts which go to make up the organism. The theory of determinants is more readily adapted to the facts than the theory of a homo-

geneous germinal substance, which Herbert Spencer, in particular, has advocated as against Weismann's view. For, overlooking the fact that the development of the heterogeneous from the homogeneous is a phenomenon more than difficult of explanation, the independent variability of one particular part of the organism would be impossible under these conditions. For the variation of one part would, on the supposition of the homogeneity of the hereditary substance, lead to a concomitant variation of all the other parts; whereas such a case as that of a man possessing a tuft of white hair among a mass of black hair is enough of itself to show that variations of particular parts can take place without in any way affecting the whole. This fact is only explicable on the supposition that the hereditary substance is essentially heterogeneous in its nature—that, for instance, in the case mentioned, the particular tuft of white hair is represented in the hereditary substance by a particular determinant or group of determinants. All those parts which have undergone independent variation in the course of generations must be independently heritable. The theory of a homogeneous germinal substance, however complex its combinations, would imply that this substance, which goes through many thousands of changes in regular succession, in order that all the heterogeneous parts of the finished organism may be developed, can alter its constitution countless numbers of times without altering the whole organism. This, however, would be an impossibility, and is contradicted by the facts.

In certain families a small scar, not larger than a pin's head, is observable behind the ear; this scar is capable of being transmitted, as has been observed, from grandmother to son and grandson. The explanation of this fact can only be found in the supposition that a determinant exists in the germ-plasm of these particular individuals which does not exist in the germ-plasm of other people, and which causes in successive generations the reappearance of this tiny abnormality.

Similarly with those remarkable cases of adaptation to their environment exhibited by certain butterflies, which adapt themselves to the colour of the leaves of the trees in which they habitually live. There are certain species of insects one race of which lives in woods, another in the fields, and the colour of both has been differentiated in harmony with their surroundings. The influence of external conditions is here obvious; but only certain parts of the organism have been modified, not the whole, as would have been the case had the germinal substance been homogeneous. That only certain parts should have been modified shows that the germinal substance contains certain autonomous living particles, whose modification entails the modification of these parts, to which they stand in definite developmental relation.

We have no knowledge of the forces which determine the composition of the biophors, or which lead to the histological differentiation of the cell. But the biophors which transform the undifferentiated embryonic cell into the highly differentiated tissue-cell must themselves possess a very specific and highly differentiated nature; they must be able to determine the specific nature of the cell into which they penetrate, and they must be capable of securing the continuity of the peculiar substance—whether of nerve or muscle or gland—which comes down from the preceding generation, for we cannot suppose continually repeated series of re-creations of such complicated substances.

In his theory of germinal selection, advanced for the first time in 1892, Weismann has admittedly overcome the great majority of objections raised against his original theory of the ancestral plasm. Even the French critics, who are more prejudiced than others against the views of the great antagonist of Lamarck, have admitted this.¹ Formerly the objection against the theory of the ancestral plasm was a serious one. On the

¹ Cf. Yves Delage, *L'Hérédité et les grands Problèmes de la Biologie générale*, p. 558. Paris, 2nd edition, Schleicher, 1903.

one hand, Weismann attributed to amphimixis, if not all, at all events the vast majority, of those variations so necessary for natural selection to work upon in the interest of the adaptation of the species ; and, on the other hand, he denied the possibility of an influence being exerted by the soma on the germ-plasm. How, then, it was justly asked, could so many variations be effected ? How, more especially, was the phenomenon of correlated adaptation to be explained ? If every individual in the animal world possesses an ancestral plasm, then it must be *his own plasm*, and it must contain traces of the modification of his body through external conditions. If the purely somatic changes are not transmissible, how, then, can amphimixis bring about such immense numbers of variations ? Amphimixis reduces itself in this case to a mingling of identical germ-plasms. Or even supposing certain variations to have been bequeathed to us by the Protozoa, whose unicellular organisms are directly exposed to the influence of the surrounding conditions, all the possible combinations of the germ elements of the Protozoa could hardly explain the correlated adaptations of the higher Metazoa. On the one hand, somatic changes are not transmissible ; on the other hand, the germ-plasm is not exposed, or is exposed in the very slightest degree, to modification by external conditions ; and yet amphimixis, or the mingling of germ-plasms, is the source of almost every variation in the animal world ! But this affords no explanation as to the source from which amphimixis derives the variations which it multiplies and propagates. For amphimixis is not in itself a creative source of variation—amphimixis can but multiply and disseminate those variations and tendencies to variation which it finds at its disposal.

Germinal selection supplies the answer to the inquiry concerning the original source of variation. It gives an explanation of those variations and tendencies to variation of the germ-plasm, which remained unexplained as long as the influence of

the soma and of external conditions was rejected. A number of those cases which the defenders of the Lamarckian system had considered as decisive evidence of the hereditary character of acquired characters have been explained more satisfactorily by germinal selection. Germinal selection is the necessary corollary to the theory of the continuity of the germ-plasm.

The elementary particles of the germ-plasm require nourishment, and receive it. We must suppose the nutrition of the biophors to be effected by means of a fluid circulating between them in the plasm. Biophors, being living units, have consequently the faculty of assimilation and of growth. It follows that the quantity of nutritive fluid which a determinant is capable of obtaining and of assimilating is the factor which regulates the growth and strength of that determinant. The strength of a determinant does not, however, depend entirely on the quality of nourishment available, but also on the assimilating power of that determinant. Primary inequalities in the composition of the determinants are caused by unequal distributions of intraplasmic nutrition.

The original condition of this unequal distribution of intraplasmic nutrition is undoubtedly to be found in the external conditions, such as light, heat, and other environmental influences. Temperature, for instance, can exert an indubitable influence on the nutritive conditions of the germ-plasm. External conditions are by no means homogeneous, and their perturbations cause differences of individual growth, of collective multiplication, and of chemical composition, among the determinants.

Even were these differences at the outset confined to but few organisms, amphimixis would not fail to enlarge their circle by the mingling of heterogeneous ids; and the reduction of the ids to one half their original number, which we observed as the result of the maturation of the elements, effects changes in the composition of the individual germ-plasm. Homogeneous external conditions cannot fail to exert different influences on these

heterogeneous elements, and thus the differences are steadily increased.

Within the germ-plasm of the same individual the quantitative and qualitative differences produced by oscillations in intraplasmic nutrition cannot fail to increase in proportion as the number of determinants in the germ-plasm increases. For in the course of development a vast number of germ-cells are produced; and when a given determinant increases from 1 to 100,000, it is scarcely conceivable that this number can be otherwise than affected by the changes of intraplasmic nutrition; and different conditions of nutrition will bring forth different conditions in the determinants. Heterogeneous determinants will respond differently to homogeneous influences. And as the nucleus of somatic cells contains also, in the somatic idioplasm, determinants identical with those of the germ, the soma can react to the same influences in the same manner as the germ did. Under the influence of these environmental conditions, identical changes can be effected in the soma and in the germ-plasm; these changes may be subsequently transmitted, and that independently of their original cause. In this manner it sometimes appears as if acquired characteristics of an exclusively somatic nature had been transmitted, whereas this is not the case.

Every weakening of a determinant—that is to say, every weakening due to insufficient intraplasmic nutrition—entails concurrently a weakening of that determinant's power of assimilation. Thus a determinant which has once entered on the path of regression finds itself in a vicious circle. In proportion as its assimilatory powers are diminished, the neighbouring determinants are able to draw an ever-increasing supply of nourishment to themselves at the expense of the weaker determinant. As the supply of nutritive matter is not unlimited, every increase in the nutritive supply of one group of determinants entails a corresponding loss in the supply of another group. Thus the

relative strength of the elements of the germ-plasm is determined by this miniature struggle for the intragerminal nutritive fluid.

These alterations in the balance of the determinants in the germ-plasm are the source of all hereditary variations. The possibility of the adaptation of the organism lies in the capacity of the variations thus produced to continue indefinitely in a given direction until "personal selection" intervenes. Alterations in the balance of the determinants are thus responsible for the increase, decrease, or variation of every part of the organism. The reason why such variations in the composition of the germ-plasm must necessarily continue in an ascendant direction until personal selection intervenes, is that every alteration in the balance of intragerminal nutrition to the advantage of one group of determinants entails concurrently a weakening of another group, at whose expense the first group will continue to increase and develop. The victorious group will attract an ever greater supply of nutritive matter, whereas the weaker group will have its already lessened supply further diminished. This process will continue until personal selection intervenes—that is to say, until the variation caused by these changes in the germ-plasm attains selective value, and becomes either useful or detrimental to the life of the species. Should the variations be useful, personal selection will favour its maintenance and subsequent increase by favouring its possessors in the struggle for existence. Should the variation be harmful to the life of the species, then personal selection will eradicate it by the elimination of those members of the species who possess it. When the variation is useful to the species, natural selection can ensure its further development; and artificial breeding, coming to the aid of natural selection, may raise that variation to the highest possible point of perfection. Should the variation thus fostered be eventually developed in a degree which renders it ultimately injurious to the species, and inconsistent with the conditions of existence of that species,

then natural selection again intervenes, and by removing those individuals in which the variation is excessive, reduces it to a level at which it is favourable to the species. It may even happen that the life of such excessively specialised individuals has to be artificially preserved by the breeder, as in the case of the pigeons cited by Darwin, whose beak is too weak to open the egg. Were the aid of the breeder removed, such unnatural extremes would inevitably be eliminated.

Thus the increase of an *ascendant* variation in a given part of the organism is limited ; in the first place by the limited quantity of nutritive substance in the germ-plasm ; and in the second place by the bounds which natural selection sets, the overstepping of which involves elimination. For *regressive* variation, on the other hand, there is no limit set until the entire disappearance of the weakened determinants has been effected ; and as soon as a given determinant A has been eradicated from the germ-plasm, the determinate A¹ disappears from the soma.

Regressive variation of the determinants is the cause of the disappearance of superfluous parts of the organism. That this is the case is a corollary of the conclusion that an organ, or a part of an organ, can only be maintained in relative perfection by means of natural selection. Natural selection operates by eliminating those members of the species who do not possess this organ, or who possess it in imperfect form. Once an organ loses its value for the species, natural selection ceases to promote its development or to ensure its persistence. Suppose a regressive variation of this organ to be produced as the result of perturbations of intragerminal nutrition, this inferior variation will be able to reproduce itself under the same conditions as the superior type, natural selection having ceased to have any reason to favour the maintenance of the latter. On the contrary, this organ having no further utility for the species, its maintenance on the same level as that which it possessed when it was useful is harmful to those individuals who do so maintain it.

The existence of the useless organ in itself need present no danger ; but the maintenance of the determinants of that organ after the determinate has ceased to have any value is very distinctly disadvantageous ; for these useless determinants absorb nourishment, which is thereby subtracted from those determinants which are of vital moment. Therefore, once natural selection has ceased to interest itself—metaphorically speaking—in the maintenance of an organ, the minus variations of that organ will, sooner or later, necessarily outnumber the plus variations ; and this in virtue of Nature's economy ; for the supply of nutritive matter is limited in the germ-plasm as elsewhere, and if the organ possesses no value for the species, the maintenance of the determinants of that organ can only be effected at the expense of the other, the vitally important elements of the germ-plasm. But this weakening of the vitally important elements is harmful to the species, and must be checked if the species is to persist.

An important rôle in germinal selection is necessarily played by amphimixis, and by the reduction of the chromosomes in the germ-plasm during maturation. Take the case of an organ A, and suppose an ascendant variation of this organ to occur, having its origin in an accidental perturbation in the balance of intragerminal nutrition. Instead of remaining a merely static variation, as it was originally, the ascendance of the determinants of A will soon acquire kinetic value, for these growing determinants will soon begin to attract an ever-increasing quantity of nutriment. The ultimate result of this alteration in the nutritive balance will be a continual strengthening of these determinants, so that the organ, or part of an organ, determined by the latter will be altered. If this alteration attain to selective value, then natural selection will either maintain or eradicate it. If it do not attain to selective value, its maintenance or disappearance depends entirely on the balance of forces within the germ-plasm.

The reduction which precedes maturation may vitally affect the constitution of a germ-cell; for just as chance leaves in a matured germ-cell, after division of the chromosomes, a majority or a minority of X determinants of a particular variation, so will the matured cell tend to develop a plus or a minus variation of the organic character represented by these determinants. Moreover, a germ-cell which contains a majority of plus variations of X determinants may, as the result of amphimixis, unite with another germ-cell having likewise a majority of plus variations of the same determinants; and the result will be a change in the determinate X in the soma. In the same way, if two germ-cells, which contain each a *minority* of X determinants, should unite, the determinate X will likewise be altered, but in a direction opposite to that of the previous instance.

It will be seen from this example that the reduction of the ids in the maturation divisions is a highly important phenomenon in the process of evolution. It must be remembered that it is not a single id that determines the character of an organ, but a *majority* of the ids in the germ-plasm. Every id contains *in potentia* all the characters of the organism, and it is only by the modification of the majority of determinants of the whole idant—*i.e.*, of the determinants in the majority of the ids—that the somatic determinate can be modified, either in the direction of a plus or of a minus variation. To take a case of sexual dimorphism, if the males with the most variegated plumage are successful, then a majority of determinants A¹, corresponding to the plumage A, must be handed down in the inheritance in order to secure a continued somatic effect; and the oftener such a majority of determinants A¹ are brought together, the less chance there is of this majority being reduced to a minority as the result of the halving of the ids.

The phenomena which accompany maturation have as ultimate result the reduction of the total number of ids in the germ-

plasm to one-half their original number. According as chance brings together, in amphimixis, two cells containing a majority or a minority of the ids A, will the embryonic cells, and consequently the cells in the growing organism, have a tendency to a plus or to a minus variation. Any germ-cell which contains a majority of plus determinants may unite with another cell containing likewise a majority of plus determinants, and the character represented by these determinants will be the more strongly accentuated in the offspring.

When a given characteristic becomes of pronounced utility to the life of the species, the determinants of that characteristic will be more likely to vary in an ascendant than in a regressive direction. For instance, the peculiar luminous apparatus developed by fishes inhabiting the dark depths of the ocean is obviously adapted to their conditions of life. Some of them possess rows of miniature organs with luminous secretion on their sides or along their ventral surface; others possess similar organs on the head; and it is extremely probable that these luminous organs serve to attract the small animals which form the prey of these fishes, just as the electric light above ground attracts insects, which are lured by it to their destruction. When such luminous organs became directly useful to the species, they were bound to increase, for those individuals whose determinants tended to a plus variation of these organs would obviously be favoured in the struggle for existence; amphimixis would tend to disseminate the determinants favourable to this new adaptation, and ultimately the possessing of luminous organs would become a characteristic of the species.

Natural selection operates only when the variations effected in the germ-plasm by perturbations in the balance of intra-germinal nutrition attain selective value—that is to say, when they become of vital importance for the species in the struggle for life. If advantageous, natural selection will further the development of such variations by eliminating gradually and

progressively those individuals who do not possess them ; and thus does natural selection tend to produce uniformity in the germ-plasm within a given species under given conditions. The more individuals of a species there are who possess a majority of determinants A^1 , corresponding to a variation A , the less chance is there of these determinants being eliminated in the reduction of the ids at maturation or in amphimixis.

But can germinal selection bring about lasting changes in the character of a species without the co-operation of natural selection, or, as Weismann calls it, personal selection ? The answer must be in the negative. Germinal selection is not by itself capable of transforming a species, although it is the origin of those variations which personal selection operates on in bringing about such a transformation. By itself, germinal selection can effect changes which possess a purely morphological value, and which do not influence in any way the life of the individual or the life of the species ; but once a variation has attained selective value, such variation must either be maintained or eradicated by the action of personal selection.

For instance, the possession of six fingers on the hand, or of a tiny scar behind the ear, does not in any way influence the life of the individual in the struggle for existence ; consequently, there is no reason for natural selection to intervene, either by the maintenance or by the eradication of such abnormalities, which have a purely morphological, as distinct from a biological, value. Such variations are exclusively the work of germinal selection, and their disappearance is effected solely by perturbations of intragerminal nutrition in the germ-plasm. On the other hand, the peculiar colouring of certain insects is the result of adaptation to peculiar conditions of life, and is the work of natural selection supplementing the action of germinal selection. There is a certain species of butterfly, *Phyllodes ornata*, a native of Assam, which shows the result of adaptation in a very highly developed degree, although numerous equally significant cases

could also be cited. The hind-wing of this butterfly is for about three-quarters of its size deep black, and for about one-quarter yellow. When the animal is at rest, this wing is covered by the fore-wing. The latter is of reddish-brown colour sprinkled with black, and with a black pattern on it resembling with extraordinary precision the venation of a leaf. A perpendicular line commences at the end of the wing, and breaks off a little more than half-way along, and three black lines flank the perpendicular one on either side (Fig. 4). After breaking off in the centre of the wing, the perpendicular line begins again, but is shadowy

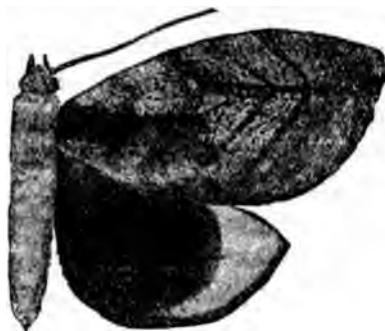


FIG. 4.—FORE-WING OF *PHYLLODES ORNATA*, SHOWING PATTERN COMPOSED OF A PERPENDICULAR LINE AND THREE BLACK LINES ON EITHER SIDE.

and indistinct, as are also its flanking lines. The insect, when at rest, exactly resembles a withered leaf, and it must be impossible to distinguish it from the leaves among which it lives. This is a case of adaptation to the conditions of the environment. The colouring of the fore-wing of *Phyllodes ornata* possesses biological value for that species, enabling it to escape detection by its enemies. Natural selection has here been at work, for those insects whose fore-wing was less perfectly adapted to the colour of the surrounding leaves were more likely to be detected and destroyed, and thus it has come about that, as only those individuals which were best adapted survived,

the adaptation has become ever more perfect—that is to say, in ever-increasing harmony with the environmental conditions.

There being only two possible kinds of variation among the determinants of the germ-plasm—namely, plus or minus variations—it is obvious that the chances of a variation in one or other of these directions are far greater than the chances that the plus or minus determinants of a given organism simply balance one another as a result of reduction and amphimixis. This dominant tendency to variation possessed by the determinants may seem to contradict the fact that many species are undoubtedly constant in their characters, and have existed without noteworthy change for a very long time. Among the *Cephalopods*, the Nautilus has certainly existed since the Silurian Age. The fact that in past ages the Nautili were extremely numerous, whereas at present the few remaining species are confined to the Indian and South Pacific Oceans, does not alter the fact that their constancy of form has been preserved throughout an immense period. How can we reconcile this fact with the tendency to variation possessed by the determinants?

Professor Emery of Bologna was, we think, the first to maintain that the tendency of certain variations to be carried to excess was an important factor in the extinction of species. But there seems no reason for supposing any variation to have an irrepressible or irresistible power, incapable of being checked by natural selection except by the extirpation of the whole species. There are several remarkable cases of adaptation known in which the particular variation stops just when the adaptation is completed—that is to say, just when such variation attains the limits of biological value, and when any further development would be harmful. These cases show that there exists some relation of proportion between variation and

adaptation. The fact is that at any point natural selection may limit the further progression of a plus variation. To minus variations, in the case of organs or characteristics harmful to the species, there is no limitation other than of the complete disappearance of the organ in question. But plus variations are arrested as soon as they attain their object—that of adapting the organism to its environment. Excessive variation is not a cause of the extinction of the *species*, but results only in the suppression of individuals who may exhibit it.

Personal selection is a very important—perhaps the most important—factor in maintaining the constancy of a species. Every excessive variation which breaks the harmony of the species is at once eliminated by personal selection. The rôle of germinal selection is a less important one. Theoretically, there is no reason for supposing that the germ-plasm may not have itself the power of checking the plus variations of any sort which may arise within it. Support is lent to this theory by the fact that numerous morphological variations which are below selective value disappear after a while. And the fact that many species are undoubtedly constant throughout very long periods shows that not every movement among the determinants towards a plus variation continues sufficiently far to attain biological value.

But the very fact that *only those variations which are of purely morphological value are capable of being controlled by germinal selection* demonstrates that the chief factor in regulating the constancy of species is personal selection. Weismann has distinctly admitted that as soon as any plus variation has gone beyond a certain point germinal selection alone is powerless to hinder its further progress. In the case of ancient and consequently constant species, the germ-plasm is fixed, the distinctive determinants of the species stand little or no risk of being weakened or eliminated, and variations which may arise are immediately checked before they attain biological value—that

is to say, before they threaten the constancy of the species. The importance of the *rôle* played by germinal selection in the elimination of plus variations is proportionate to the fixity of the germ-plasm, as in the case of constant and ancient species. In the case of new, and consequently less constant, species this *rôle* of germinal selection is less important, for, the germ-plasm being less fixed, the determinants are more likely to gain a plus variation in a majority of the ids of a large number of individuals.

Every plus variation of the determinants of a given organ entails a minus variation of other determinants, because of the limitation of the quantity of intragerminal nutrition ; and every group of determinants which finds itself in a course of ascendant variation tends to attract an ever-increasing supply of nutriment, so that the regressive variation of the rival group is thereby more accentuated. There is a maze of intricate and complicated relations between the component parts of the germ-plasm, and the perturbations which take place continually in the balance of these component parts constitute the origin of all hereditary variations. Such variations may be of two kinds : sudden variations, which affect at the same time a large number of individuals ; or gradual variations, slow transformations taking place within the germ-plasm of single individuals, or of a few, and related to gradual adaptation to environing conditions. De Vries has particularly insisted on the sudden and more widespread variations, which he has aptly termed "mutations." Such mutations are especially frequent among plants, as the experiments of De Vries have shown. But they are also operative in the animal world. They have probably contributed in particular to the evolution of secondary sexual characters. In the case of plants, mutations are remarkable for the pronounced character of the changes they effect ; and as vividness and pronounced character are essential features of secondary sexual distinctions which are observable especially in birds and certain

butterflies, it seems reasonable to suppose mutation to have been the origin of such distinctions.

It is necessary now to say a few words concerning the application of the theory of germinal selection to the higher intellectual faculties of mankind. We are confronted by two sets of facts which seemingly contradict each other : the undoubted constancy throughout immense periods of certain species, and the adaptability of organic life in general. But between this constancy and this adaptability there is no real antithesis. Constant species are old species ; they are species which are adapted definitely to definite conditions, and these conditions being constant, the necessity of readaptation has not presented itself, and the determinant complex of these species has become fixed in accordance with these conditions. That is to say, those variations which tended to bring the species into disharmony with its environment have been constantly eliminated, until at last the specific determinant complex, adapted to the specific vital conditions of the species, has obtained so overwhelming a majority in the germ-plasm of every individual of the species that variations can no longer attain biological value. Variations, when they occur, are eradicated simply by adverse intragerminal influences. Such constant species are not non-adaptable ; they *have* adapted themselves, and have passed through a series of successive adaptations, until equilibrium between them and their environment was established. And this equilibrium, owing to the constancy of the environing conditions, has not been since disturbed. Younger species, less constant, and apparently more adaptable, are merely undergoing before our eyes a period of instability which constant species underwent in past ages, before their equilibrium with surrounding conditions was attained.

Let us apply the theory of germinal selection to specific psychical characteristics, such as the talent for music or for

mathematics. It is, we think, an error to suppose that the talent for music, for instance, or for mathematics, had its primary origin in the human species. The musical genius which provides for civilised mankind one of the highest and purest joys is not *qualitatively* different from the auditive acquirements of the dog or the savage. Musical gifts may be compared to an instrument which our animal ancestors already possessed, which they have handed down to us, and on which we have learned to play with ever greater refinement, according as our culture advanced. The savage, the primitive man, listening in the silence of the forest to detect the sounds of an approaching enemy or victim, depended in great measure on the delicacy and perfection of his auditory apparatus. According as he heard approaching sounds with greater or less precision was he more or less likely to survive in the struggle for existence; and under these conditions the auditory apparatus was bound to attain to ever greater perfection, as the plus variations called forth by perturbations of intragerminal nutrition would be favoured by natural selection. The auditory apparatus of man was not created for the purpose of composing a symphony or an oratorio, but has been evolved from the auditory apparatus of his ancestors, whether animal or human. In the same way, the hand was not evolved for playing the piano, but for seizing prey. The achievements which the hand can accomplish, among cultured nations, are artificial, in the sense that they have their origin, not in the necessities of the struggle for existence, but as the luxurious flowers of a rich and developed civilisation.

If we accept the elementary fact that the hereditary substance is composed of determinants, there can be no doubt that each specific talent results from a predisposition which is nothing but the expression of the preponderance of a given group of determinants in the germ-plasm. There are different and well-defined determinants for the musical talent, for the mathe-

matical, metaphysical, oratorical, and other talents. Just as little as the "man in the street" could compose the Ninth Symphony of Beethoven, or exhibit the mathematical genius of a Herschell, a Carnot, or a Poincaré, just as little could "any doctor of philosophy" think out the system of Immanuel Kant, or "any politician" display the oratorical gifts of a Demosthenes or a Cicero. And how are we to explain this extraordinary development of specific talents, so diverse in their nature, if not by the hypothesis of a heterogeneous germ-plasm, composed of well-defined and sharply differentiated elements? How can we explain that one genius, such as Charles Darwin, should possess an extraordinarily developed faculty for prolonged and detailed biological research; while another genius, such as Richard Wagner, should possess a correspondingly developed faculty for such totally different achievements? Obviously, the psychical organisation of the former possessed a solid majority of determinants of one specific talent, and the psychical organisation of the latter a solid majority of determinants of another specific talent.

The germ-plasm theory also explains how the development of a specific talent or faculty may attain the colossal proportions which the musical talent attained in the case of Bach and Beethoven. Supposing that a progressive variation of the specific determinants of the musical talent sets in as the result of perturbation in the intragerminal nutrition, such a variation can theoretically be evolved to any possible height, seeing that a greater or lesser development of the musical talent is not a matter of biological importance either for the individual or for the species. The only limitations to this ascendant variation of the musical talent are those which amphimixis or the reduction of the ids during maturation may impose. The reduction of the ids by half involves a risk if the musical faculty be but slightly or, at all events, not sufficiently developed; for there is here evidently a chance that the determinants of the faculty

in question may be completely eliminated, or reduced to a minority, as a result of this reduction of the ids. This danger is excluded in cases where the determinants of the musical factor are in very considerable numbers, as in the case of a genius. Amphimixis, again, involves a risk, since the highly specialised determinants of the musical faculty may be placed in a minority by a greater mass of other determinants imported in the act of fertilisation. It is to be remarked, however, in the particular case of this special faculty or talent for music that those persons who possess it generally ally themselves with others who share their taste and faculty; so that the chance of an elimination, or rather of a "minorisation," of the determinants of the musical faculty, as a consequence of amphimixis, is not here so frequent as in the case of other specific faculties where less importance is attached to the choice of a partner.

If there is no "minorisation" of the determinants of a particular talent through amphimixis or through the reduction of the ids, the specific talent in question may be evolved to any possible height—at least, theoretically. Practically, a limit is set to the ascendant variation of every specific talent beyond a certain height, and the reason for this limitation is not difficult to discover. Where, through judicious combination of partners, the determinants of a specific talent have attained a degree the concrete expression of which is a symphony of Beethoven or an opera of Wagner, it is practically impossible for this specific talent to attain the same height in the progeny of a Beethoven or a Wagner. The reason is to be found in the law of the calculation of probabilities. Briefly, we may here say that, in order that a Beethoven may reproduce a second Beethoven, or a Beethoven junior greater than the senior, it would be necessary that the second party to that reproduction—namely, the mother—should possess determinants of the musical faculty equal to those of the father. In the first place, the chance that a second person could be found possessing the same potentiality of deter-

minants of the musical faculty is infinitesimally small ; in the second place, the chance that such a person, if found, would be a female is *nil*. Thus is it logically and practically impossible for a genius to reproduce a similar genius. To this inference from the simple calculation of probabilities must be added the undoubted fact that genius is often a pathological phenomenon, the brilliant fruit of a degenerate tree ; although the view of Lombroso that the genius is biologically akin to the epileptic is not universally valid.

But it would be an unjustifiable simplification of matters to suppose that the musical genius, or the philosophical genius, depended for the universal development of his specific talent on the determinants of that specific talent alone. The genius of a Beethoven is not the result of a progressive evolution of the determinants of the musical faculty by themselves ; it is the result of a synthetic and harmonic evolution of a number of different psychical faculties. The genius is necessarily the result of the synthesis of a number of psychological factors ; an individual otherwise imbecile would never have composed the Ninth Symphony or delivered the discourses of Burke on the French Revolution. General culture of the faculties is essential to the production of genius, which is the product of a co-ordination of different psychical forces. A modification of one of these forces, although seemingly a secondary one, may entail profound modification of the ultimate result. It is far easier to ensure throughout a long line of descendants the continuity of a general standard of culture than to ensure the maintenance of one specific talent at a highly developed degree ; for in the first case it is merely necessary that the parents should always be individuals possessing a certain general culture, whereas in the second case they must possess *one* specific faculty in an unusual degree. In the first case, the different cultural tendencies of the parents manifest themselves in many and varied forms, and the cultural level of a family may in this way be main-

tained, as Francis Galton has shown, during long periods of time.

It may be asked, What, then, is the precise nature of the changes which operate in the germ-plasm? In ultimate instance, all such changes are *quantitative* in their nature. The isomeric combinations known to chemical science are in reality likewise quantitative in the last resort, although apparently qualitative. All changes brought about in the germ-plasm are produced by variations which take place, either in the number of the different elements which go to make up a given combination, or in the arrangement of the elements in a given space. A qualitative variation of a given determinate can be the result of a variation in the proportion of the elements which go to make up its determinants—for instance, when the proportion of an element X to another element Y is changed in such a way that the character of the determinate XY^1 is thereby altered. Or such qualitative variation may result from a simple change in the *arrangement* of its component elements, their number and proportion remaining the same, as in the case, for instance, of a beetle on whose back 100 hairs are scattered sparsely, and separated by a certain distance from each other, and whose progeny, when they attain to the condition of adult insects, have the same 100 hairs, but all on one spot, forming a sort of brush. Between the mother beetle and the next generation there is an apparently qualitative difference—namely, the brush—but this apparently qualitative difference has simply resulted from a different arrangement of the same number of elements, and is in reality a quantitative difference. All differences in the ultimate instance are quantitative. Yet there is a sense in which we may fairly say that, through the perturbation of intragerminal nutrition, each elementary vital element is capable, not merely of quantitative growth or diminution, but also of being, through these nutritional variations, affected qualitatively.

The nature of the forces which regulate the movements in the

germ-plasm is unknown, and it is useless to speculate about it. We can only say that an infinite number of relations connect the determinants of the germ-plasm with one another. We are here in the world of the infinitely minute, and it is difficult to form a conception of the rhythmic movements of the elementary living particles. But we may say that *a priori* no valid objection can be raised against the conception which sees in the germ-plasm a heterogeneous substance formed by heterogeneous determinants, each determinant or group of determinants standing in definite relation to a given part of the finished organism. Only those variations which arise from the germ-plasm are transmissible by heredity. The facts revealed, alike by recent histological research and by observations on the phenomena of heredity, are in harmony with this theory of evolution and development.

CHAPTER IV

THE LAMARCKIAN HYPOTHESIS OF THE INHERITANCE OF ACQUIRED CHARACTERS

THE theory of evolution as expounded by Weismann stands in direct contradiction to the older theory which has been in the field since the days of its originator, Lamarck. The service rendered by Lamarck to biological science by his proclamation of the fundamental truth that the world of organisms as we know it is not the result of a number of specific creations, but of a long and complicated process of evolution from the simple to the complex, from the homogeneous to the heterogeneous, was a great and lasting service. The same cannot be said of his explanation of the mechanism of the evolutionary process by the hereditary transmission of bodily and mental modifications resulting from functional use or disuse; though this view has until lately held a foremost place among the theories advanced to explain the process of evolution. The Lamarckian theory is founded entirely on the assumption that somatic characters, whether physiological or psychological, are capable of being modified by functional use or disuse or by surrounding conditions, and that the modifications are capable of hereditary transmission. A modification of an organ A, brought about by use or disuse of this organ, is transmissible by heredity, and thus the modification is definitely acquired for the race. The chief origin of organic changes, according to Lamarck, is to be found in the functional use or disuse of organs or parts of organs, and the hereditary transmission of the modifications thus acquired.

The first part of the Lamarckian proposition—namely, that bodily characters are capable of being modified by use or disuse—is undeniable; but that such purely somatic variations—for which the term “modification” is now conveniently employed—are transmissible by heredity is a conclusion based on no scientific fact.

Were the Lamarckian theory acceptable, it would obviously facilitate the comprehension of a number of phenomena otherwise difficult of explanation. Applied to the domain of social psychology, it would afford an easy solution of various social questions; and it is curious that certain Socialist writers, such as Professor Ferri, should go out of their way to combat what they term “Weismannism,” and to strike a blow for Lamarckism;¹ since the latter theory, if true, would afford facile justification of the régime of aristocracy and castes, as we shall see later on. As we are unable to accept the Lamarckian theory, and as Weismann’s theory of germinal selection and of ancestral plasma is in direct antagonism to it, and as we propose to apply the latter theory to social phenomena, we think it desirable, in view

¹ E. Ferri, *La Sociologie criminelle*, p. 387 (Paris, F. Alcan, 1905). It is evident from his remarks on the subject that Professor Ferri has practically no acquaintance either with the doctrine of Weismann or even with Darwinism or Lamarckism. He says, for instance, in a foot-note, that Lamarckism, by its theory of the adaptation of the individual to the surrounding conditions, does away with a serious “lacuna” in the Darwinian theory of descent! To say nothing of the fact that the Darwinian theory of natural selection and of the survival of the fittest by no means excludes adaptation, but rather implies it, and is based on it, Professor Ferri seems unaware that the very essence of Weismann’s doctrine is the necessity of giving the factor of adaptation adequate consideration. Not only is the idea of the “fittest” to be taken as meaning the fittest in relation to certain conditions (consequently as synonymous with the best adapted to those conditions), but those intragerminal variations which arise are only selected according as they tend to a greater or less adequate adaptation of the individual to the environment. The only criterion of the utility of a variation lies in the harmony of that variation with environing conditions. And we shall see that Weismann’s conception of amphimixis in particular interprets this as facilitating an ever greater adaptation of the organism to its environment.

of their antagonism, to deal briefly with the Lamarckian theory, and to examine some objections against it, which, indeed, seem to render it valueless.

It has been often alleged that results of mutilation are transmissible. At the congress of German scientists held at Wiesbaden in 1887 dogs and cats were exhibited whose tails were abnormally short, and it was alleged that this shortness had been inherited from the parents, whose tails had been cut off. It was likewise alleged that mutilations, such as scars, or slight deformations of the lobe of the ear, were also transmissible. But a belief in the transmission of mutilations has now been abandoned, even by most of the apologists for Lamarckism; for, in the first place, the allegations respecting the transmission of mutilated tails, scars, and the like, turn out to be wholly worthless. When they were submitted to a rigorous examination no well-authenticated evidence was forthcoming, and no guarantee could be given even as to the accuracy of the essential fact—namely, that one or other of the parents of the mutilated animals had been in reality mutilated. In the second place, experiments made by Weismann on no less than twenty-two successive generations of mice, in which the tail of both parents was in every case cut off, yielded an entirely negative result; not one of the 1,592 mice born in successive generations from mutilated parents bore a trace of this mutilation which had been inflicted on both parents. This experiment of Weismann's may be fairly regarded as decisive as far as the transmission of somatic mutilations is concerned. In the third place, it has been demonstrated, notably by Bonnet, that those cases in which dogs and cats are born with abnormally short tails are not due to the inheritance of similar mutilations inflicted on one or other of the parents, but that the nature of these inborn mutilations is entirely different from that of acquired mutilations. As a matter of fact, such inborn mutilations are the result of spontaneous regressive variation of the tail due to natural internal causes,

and are often characteristic of the stock, as in certain races of cats in Japan and the Isle of Man. In the fourth place, the experience of animal breeders in general is wholly adverse to a belief in the transmission of acquired mutilations. The tail of the female in certain races of sheep is invariably cut off for breeding purposes, but no result of this artificial mutilation is ever transmitted.

Turning from the cases of somatic mutilation, we come to those of acquired and transmissible diseases. It is in the domain of pathology that Weismann's theory encounters most opposition. We believe, however, that this opposition is based on a misconception. It is frequently alleged—chiefly, indeed, by writers who appear to be unacquainted with Weismann's works—that Weismann and his school deny the fact of heredity.¹ This is, indeed, an astounding misrepresentation. As if any biologist at the present day could deny that patent and obvious fact if he would! A mathematician might as well deny that $2+2=4$; an astronomer might as well deny the law of gravitation. It is needless to refute this misrepresentation. Weismann calls in question *the heredity of acquired characters which are purely somatic in their origin*. He has, of course, never questioned the heredity of those fundamental characters which affect the germ-plasm, and without which organic life as we know it would not only be non-existent, but unthinkable.

But those who contest the accuracy of Weismann's theory have often objected that certain characteristics which are undoubtedly acquired are nevertheless hereditarily transmitted.

¹ A distinguished physician has told us in conversation that "the medical world are unable to accept Weismann's conclusions on heredity, as it is evident to medical science that numerous diseases are transmissible," and he pointed to the hereditary transmission of syphilis as notably contradicting the views of Weismann. If such be the ideas of a man of science, it is not surprising that the laity should have a false conception of the doctrine of the Neo-Darwinian school.

It is, indeed, incontestable that certain acquired pathological characters are hereditary, but the contradiction which pathology is thus supposed to offer to Weismann's theory is founded on a misunderstanding. It is, first of all, a remarkable fact that by no means all pathological characters are hereditary, so that there is no necessity for pathological features, as such, to transmit themselves to subsequent generations. This faculty of transmission is restricted to certain diseases *which affect not only the body, but also the germ*. Take the case of syphilis, frequently adduced by pathologists as contradicting Weismann. Syphilis is a microbic disease, fundamentally affecting the blood; and it is obvious that the reproductive or germinal cells, being dependent, as well as the somatic cells, on the supply of blood, are liable to the same infection by the toxic properties of the microbe as the rest of the organism. It is the same with alcoholism. The germ-cells are as liable as the rest of the organism to an infection by the toxic properties of the alcohol circulating in the blood.

It may be urged, however, that all hereditary diseases are not diseases of the blood; that tuberculosis, for instance, and cancer are hereditary, and yet not, properly speaking, affections of the blood-system. It may be replied, firstly, that tuberculosis is not transmissible *directly* as syphilis is, but indirectly; that is to say, a *predisposition* to tuberculosis is transmitted by diseased parents, but the clinical form of tuberculosis, whether of the lung or the intestine, the larynx, the bones, the ganglia, or the skin, or any other part, is never transmitted. On the contrary, it has been demonstrated that the children of tuberculous parents, provided they be removed at an early date from their surroundings, are able to survive without ever becoming tuberculous. Two remarks are therefore permissible with regard to the hereditary transmission of the predisposition to tuberculosis. Firstly, that the greater predisposition to tuberculosis inherited by the children of diseased parents is incontestably

due to a general weakening of the constitution of the parents ; and this weakening, this sapping of the constitution, must inevitably react upon and affect the germ-cells, as much as it reacts upon and affects all the somatic cells. Secondly, tuberculosis has, more than any other disease, a social aspect as well as a biological one. The child who is born of parents whose constitution is undermined by tuberculosis, who is consequently hereditarily weak, is, in the majority of cases, placed in an environment which cannot fail to influence unfavourably and to weaken still further this already weakened constitution ; and thus the child is an easy victim of the tubercle. In a sense, therefore, tuberculosis may be regarded as acquired afresh in each successive generation ; it is not the disease itself which is transmitted, but a certain pathological predisposition due to a weakening of the constitution. That this is really the case—that tuberculosis is, strictly speaking, always acquired, and that the predisposition to its acquirement may be counterbalanced by therapeutic means—is proved by Professor Grancher's experiment in France. He separated children from their tuberculous parents, and removed them to more healthy surroundings, with tolerably successful results.

The same may be said in regard to cancer. No single case of the actual transmission of a clinical form of cancer has, to our knowledge, been observed, and the inheritance of cancer is now very generally denied altogether. But even were a predisposition to cancer hereditary in the case of children of cancerous parents—which is by no means proved—it is obvious that the morbid growth of tissue in the organism, by its usurpation of an abnormal quantity of blood, must react upon the reproductive cells and weaken them to a greater or less degree.

The transmission of epilepsy has also been urged against Weismann's theory. It must be remarked, however, that the experiments of Brown-Séquard on guinea-pigs, which form the

basis of these objections, have recently been called in question.¹ Epilepsy appertains to the same pathological series as insanity and all mental diseases, and is produced by irritation of the brain cortex. It is very probable that, in the case of the apparent transmission of epilepsy, it is not the disease itself, but a general pathological condition which is transmitted, a condition which may reveal itself in epileptic attacks, or in some other clinical form of cerebral disorder, or in a tendency to crime, or in neurasthenia. In fact, the particular manifestation will depend on the external conditions of development. It is certain that epilepsy, insanity, crime, and neurasthenia belong to the same pathological stock, and frequently the same individual suffers from several, or even all, of these affections. The hereditary transmission of epilepsy presents, therefore, no greater theoretical difficulty than the hereditary transmission of insanity, whether clinical or moral.

That such hereditary transmission does, in fact, consist in the transmission of a general pathological condition, rather than of the disease itself, is shown by the case of traumatic epilepsy produced by a blow on the head. That epilepsy can be induced by an injury to the skull affecting the cerebral centres is a fact long since established. Were somatically acquired characters transmissible, as is alleged by the Lamarckian school, then the malformation of the skull and of the cerebral centres which produced the epilepsy should be transmitted to the succeeding generations along with the disease itself. This, however, is not the case: the somatic malformation is never transmitted.

¹ Vide Ziegler, *Zoologisches Centralblatt*, 1900, Nos. 12 and 13, who cites especially Sommer and Binswanger in this connection. Sommer (*Die Brown-Séquardsche Meerschweinchenepilepsie und ihre Übertragung auf die Nachkommenschaft*, Jena, 1900) relates experiments made by him on about forty guinea-pigs, in order to test the accuracy of Brown-Séguar's experiments. Sommer's experiments gave an entirely negative result, and he concludes that the experiments of Brown-Séguar can no longer be relied upon in support of the theory of the hereditary nature of epilepsy.

Undoubtedly the condition of the brain structure in the offspring—supposing the pathological condition of which epilepsy is a manifestation to be hereditary—is not the normal condition; but the injury to the skull, which was the original cause of the disease in the parent, is not handed down to the child. Should, therefore, traumatically induced epilepsy be hereditary—which is questionable—it would seem that it is not the actual disease itself, but a predisposition to it, which is transmitted.

That traumatically induced epilepsy, if hereditary, should contradict the contention that somatically acquired characters are not hereditary is an entirely incorrect assumption. For the actual injury itself is not transmissible; it remains a purely somatic, an exclusively individual, phenomenon. The effect of the injury would alone be transmissible; and it is not more difficult to conceive of so profound a disturbance of the psychical life exerting an influence by reaction on the reproductive organs than to conceive of a similar reaction in the case of tuberculosis, which involves a profound disturbance of the physical life of the organism. It must be repeated, however, that the experiments of Brown-Séquard, supposed to prove the hereditary transmission of traumatically induced epilepsy, are by no means either conclusive or convincing.

It is frequently said that “instincts are but inherited habits,” and by this definition it is held that the phenomena of instinct are explained. Habits, in the course of individual life, tend to become automatic; and it is maintained that this acquired automatism, transmitted by heredity, has developed into instinct, which thus presents the appearance of being *a priori*; whereas such instincts, although *a priori* in every individual after a certain time, are not *a priori* in the sense of being anterior to all individual experience.

To this conception of instinct as an “inherited habit” there is a fundamental objection which relates to cases in which all

possibility of "habit" is excluded. Weismann has adduced a number of cases of wonderfully complicated and useful instincts manifested by numerous insects—for instance, those which manifest themselves during the chrysalis stage, and which secure the better protection and preservation of the insect—which express themselves *only once* during the life of the insect.¹ Here all possibility of "habit" is excluded; the inheritance of a modification brought about by use or disuse is impossible in the case of an instinct which manifests itself but once in the course of the life-history. Such instincts can only be interpreted in terms of natural selection. Those insects which lacked the instinct to adopt those protective measures during the chrysalis stage would necessarily, through the mechanism of natural selection, be more easily destroyed than those which were better protected; and hence there would eventually survive only those which instinctively adapted themselves to the environing conditions. We must remember, also, that the theory of germinal selection fills a gap in the Darwinian theory of natural selection; for whereas, according to the Darwinian theory, the advantageous variations to be selected depend for their production upon chance; according to the theory of germinal selection such variations are induced by intragerminal perturbations, and remain to be selected or not according as they are, or are not, of biological value to the individual or to the species.

Those instincts, which manifest themselves but once during the course of the individual life, cannot, therefore, be explained as the result of "habit" during that individual life, or as the result of the transmission of habit. There can be no question of this instinct being "strengthened by use." But it may be urged that there are instincts which *are* strengthened and developed by use in the course of the individual life, and which, handed down from generation to generation, become finally characteristic of the species. Such, it is said, is the instinct of

¹ Weismann, *Vorträge über Deszendenztheorie*, i. 129 ff.

fidelity in the house-dog, the instinct for hunting possessed by the hound, and so on.

Nevertheless, the explanation of the origin of instinct through natural selection is not only sufficient, but also by far the most rational explanation. Instincts depend upon a particular mechanism of the brain, which is as variable as the other parts of the organism ; they are, further, necessary in the majority of cases for the survival of the species, and are consequently fully and precisely adapted to the vital conditions of the species. It is, therefore, only rational to attribute their origin and subsequent evolution to natural selection.

There is no great difference between instinctive and reflex phenomena ; and reflex phenomena, established by habit, often present the appearance of being instinctive. The act of winding up our watch when undressing becomes so mechanical that we perform it even when we change our clothes in the daytime ; and all the complicated phenomena of walking, reading, speaking, playing the piano, become eventually the purest reflex actions. Yet reflex mechanism, so greatly strengthened by constant use during the individual life, is not transmitted. This fact, combined with that of the hereditability of those instincts which manifest themselves but *once* in the individual life, shows that the factor of use or disuse is an entirely negligible one in the evolution and inheritance of instincts.

The case of the fly or the butterfly, which takes rapidly to flight on the approach of some enemy, is more rationally explained by natural selection than by the theory of use and disuse. And selection is certainly the origin of that instinctive fear of man shown by certain species—a fear which has its origin in an act of volition, which becomes instinctive under the influence of circumstances. The case of the walrus in the waters of the South Sea Islands, visited by German explorers in 1799, is an instructive example of the volitional origin of this instinctive fear.¹

¹ Weismann, *Vorträge über Deszendenztheorie*, ii. 63.

On the arrival of the expedition, the animals were perfectly tame and fearless ; but advantage was taken of this to hunt them down and secure their flesh as meat for the European visitors, and by the end of the winter the animals were already difficult to approach. The following winter, when another exploring party arrived in those parts, the walrus fled whenever it perceived a human form in the distance ; it had grown to recognise man as its enemy, and took refuge in instinctive flight. Here is an example of an act of volition which, with the progress of time, has become instinctive ; it is an instinct which is dictated by the necessities of the life of the species, which consequently owes its origin and development alike to natural selection.

The changes effected in the nervous centres of the insect, which flies immediately upwards and in the contrary direction when it perceives the quickly approaching shadow of an object about to pounce upon it, are likewise due to natural selection. Those insects whose nervous mechanism did not respond to the movement of the approaching object must soon have been extirpated, and natural selection is here again the originator of the instinct of flight. But the instinct of flight in the case of an insect, unlike that in the case of the walrus, is not the result of an intellectual or volitional process. It cannot be, for the simple reason that the insect does not know what death is, and is consequently unable to take measures to escape it. If the insect be caught by an approaching object, it is instantly killed, and no opportunity is afforded it of learning by experience. And, furthermore, the necessary intelligence for a reasoned volitional process is lacking in the case of the fly or the butterfly. Flies and butterflies know nothing of death ; but a certain external movement reacts mechanically on their nervous centres, and causes them to fly away instantly and in an opposite direction. Obviously this instinct, essential to the very existence of the species, is a fundamental characteristic of that species,

just as the impulse to flee from man becomes in time instinctive in the walrus. In both cases the instinct is due, not to "inherited habit," but to natural selection.

The question may be raised as to whether instinct may not be the result of tradition. In some cases this may be true. In the case of the walrus, mentioned above, it is possible to maintain that the instinct of flight from man is the result of tradition rather than of natural selection. The example of the older animals, which have themselves been pursued by hunters, may be followed by the younger ones, and these may hand on the tradition of fear of man to their progeny, and so forth, throughout several generations. Thus the instinct of flight may finally appear as constant as if it were a result of long and rigid selection. The instinct to fly *in general* may likewise be a traditional instinct with insects; but the same nervous mechanism which acts in this case acts also in the case of approaching danger, when flight is, although unknown to the insect, an indispensable necessity to the species. This instinct to fly from an approaching object is of such vital importance for the existence of the species that it cannot be left to simple tradition. In this case it would remain purely individual, incapable of hereditary transmission, and would have to be learned afresh by imitation in each individual life; whereas a fundamental instinct, bound up with the very life of the species, must needs be an inborn ancestral characteristic of the species, and dependent upon natural selection. For this reason it is probable that the instinct of flight in the walrus is also a fundamental racial instinct, not the result of mere tradition, but of natural selection.

We have examined the Lamarckian theory in regard to hereditary transmission of mutilations, of disease, and of instinct, the three sets of cases generally supposed to constitute its strength. We have seen that, in regard to the transmission of mutilations, it is based on no single scientific fact; in regard to the transmission of disease, we have seen that criticisms of

Weismann's view are mostly based on a misunderstanding ; in regard to the transmission of instinct, we have seen that it wholly fails in respect of one great category of instincts—those which manifest themselves only once in the course of the individual life ; while an explanation alike more rational and more in harmony with what we know of the process of organic evolution in general is furnished by natural selection.

But even were we to suppose the impossible, and to grant the accuracy of the Lamarckian theory in certain cases, there would still remain entire categories of cases to which it cannot be applied. These cases are those which concern the modification of purely passive parts of the organism—the colour, the skeleton of the arthropods in its various parts, etc.—and also the modification of non-passive organs in the sterile members of a species—for instance, in worker ants.

The passive, purely morphological parts of the organism are useful by their mere presence, and not by any active assistance they render to the animal. Their variation cannot, therefore, be explained as a result of use or disuse, since they are by their nature entirely inactive. Such variation must be due solely to natural selection. And if natural selection is thus capable of transforming entire parts of the organism without the co-operation of any other factor, why, as Weismann asks, should we restrict this capacity of natural selection to the purely passive parts ? The active parts of the organism play a *rôle* considerably more important in the struggle for existence ; and as the conditions of that struggle are governed by the law of natural selection, it is only rational to suppose that law to determine the variation of the active as well as of the passive parts of the organism.

The degeneration of the wings of the worker ants is an example of a change effected in an *active* part of the organism in a caste which is sterile, in which, consequently, the transmission of variations resulting from use and disuse is excluded. The wings

of the worker ants have already disappeared in the chrysalis stage, though they appear as rudiments in the larva. Now, since the impregnation of female ants is invariably associated, as in the case of bees, with a nuptial flight in the air, the degeneration of the wings cannot have begun until certain female ants became sterile workers in which no nuptial flight could take place.

From all the facts at present known to us, we may conclude that the disappearance of useless organs follows certain laws. We are still unable to give a precise definition of these laws or of their mechanical basis; but observation shows that the degeneration of an organ commences with its final stage of development, continuing in a backward direction till the embryonic stage is reached. The necessity for a degeneration working gradually backwards can best be understood from the consequences which degeneration working forwards would entail. It would be impossible for any organ or part of an organ to be suddenly and completely removed without causing a profound, and in many cases a fatal, disturbance of the whole developmental process; but there is a minimum derangement of the development when the degeneration affects, in the first instance, the final stage of that organ or part; and a degeneration in working backwards merely follows the line of least resistance. The further back in the development the degeneration sets in, the greater is the number of subsequent disturbances and dislocations of parts. It is as if, in demolishing an edifice, instead of beginning by the removal of the roof, one were to begin by removing the lower stories or the foundation-stone.

We may note in passing that the biogenetic law of the "recapitulation of the phylogeny" (or racial evolution) in the ontogeny (or individual development) is entirely in harmony with the determinant theory.¹ By the continuity of the germ-

¹ It must be remembered that this biogenetic law is not absolute. A distinction must be made between palingenesis—simple, though abbrevi-

plasm the inheritance of the new generation is made up of the id complex of the preceding one. A new determinant or group of determinants can never come independently into existence, but arises through a variation effected in the preceding group. As spontaneous variations, however, never effect a change in *all* the homologous determinants of the germ-plasm, but only in a majority, a minority of the old determinants, representing the former condition of the organ which has been readapted to altered circumstances, still remains in the germ-plasm. This minority of old determinants may persist throughout long periods, but slowly, though surely, its influence on the ontogeny diminishes in the course of successive generations. For a time the persistent determinants of a former organ may continue to manifest themselves somatically throughout the whole course of the life-history as a rudimentary organ, as in the case of the appendix vermiformis in the human species, which persists during the whole life of the individual; but with the progress of time and the accumulation of new variations, implying continuous readaptation, the *nutritive* supply of such determinants becomes ever less, the force of the determinants becomes ever weaker in consequence, and the determinants can only manifest themselves somatically during a longer or shorter period of the embryogeny. The gill-clefts which served as respiratory organs for our fish ancestors, and which still appear as vestigial structures in the human embryo, condemned to all but complete disappearance before birth, are a case in point.

To return, after this digression, to the Lamarckian theory, we have observed that the degeneration of the wings—and, let it be added, of the ovaries—in the worker ants shows that regressive variation can set in where all possibility of hereditary trans-

viated, recapitulation of the history of the species—and cenogenesis—i.e., a modification of the historical sequence brought about by the more recent adaptations of various stages in the ontogeny to new conditions. Both palingenesis and cenogenesis find an explanation in the determinant theory.

mission is excluded owing to the sterility of the caste. This alone suffices to show that the Lamarckian hypothesis of the hereditary transmission of modifications arising from use or disuse is wholly insufficient—if, indeed, it be applicable at all—to explain the phenomena of organic evolution. Another instructive example of the insufficiency of the Lamarckian theory is also furnished by the ant. The institution of slavery in certain species, and the development of a race of worker ants, can only have taken place after the collective life in society had long been established among these remarkable animals. But by this time the worker ants were sterile; and just as the absence of wings and the regression of the ovaries show that structural variations have been established after the sterility of the working ants sets in, so these profound modifications of the social life show that variations of instinct can likewise occur.

An argument frequently urged against the critics of the Lamarckian theory, and which Herbert Spencer was the first to bring forward, is that based on coadaptation. It is argued that the correlated variation of the different component parts of an organ, or the correlated variation of different parts of the organism itself, in response to a primary variation of a single part, shows that natural selection is insufficient as an explanation of the phenomena of adaptation. For instance, the development of the antlers of the Irish stag entails a correlated development of the skull, of the neck, of the muscles in the neck and back, of the bones and muscles of the legs, and of the nerves attendant on the muscles. This harmonious development of different parts of the organism cannot, it is maintained, be due solely to natural selection.

In the first place, it must be noted that the extraordinary development of the antlers of the Irish stag was not the work of a few generations, but of many. Many generations must have come and gone before those antlers attained to the proportions which they finally possessed. But if *time* was necessary

for such a development, then time was likewise available for secondary variations and progressive adaptation of the other parts—the muscles, nerves, bones, etc. The antlers themselves probably varied but little in each generation, and there is no reason why there should not have been similarly gradual progression in the development of the secondary variations in other parts. If the development of the secondary variations did not proceed step for step with that of the primary variation, it is by no means necessary to assume that the individual would thereby immediately be placed in a position of inferiority in the struggle for existence.

Useful variations, as we have said, are not only *possible*, but *necessary*, if we grant the fundamental assumption that the germ-plasm is composed of determinants. Therefore, whenever the coadaptive strengthening of the muscles, nerves, etc., of a stag, in harmony with the development of the antlers, became definitely useful, we must suppose that the determinants of the muscles and nerves varied in a progressive direction—that is to say, in the direction of further development. The germ-plasm of numerous stags—nay, even of the majority—may at first have contained but a *minority* of ids with a majority of determinants in the plus direction; but those stags whose germ-plasm contained a *majority* of ids with a majority of plus-varying determinants would alone be favourably selected in the struggle for existence. Thus there is an indirect connection between the utility of a variation and its appearance.

We have not as yet sufficient knowledge of the details of coadaptation to enable us to offer a satisfactory explanation of these phenomena. We can, however, say with confidence that no *a priori* objection can be raised against their explanation by natural selection. And though we have as yet insufficient data to enable us to explain all the facts of coadaptation of *active* parts, we should remember that coadaptation is not confined to active parts, but is also observable in passive parts;

and here the Lamarckian theory of use and disuse is inapplicable.

A study of the growth of insects shows us that the development of the cuticle scarcely ever takes place without *concurrent* small variations of the external membranes, especially of the segments, with their brushes of setæ, stings, and so forth. These newly constituted or merely modified membranes, however, are formed or modified before the old protective cuticle is thrown off, and under the protection which it affords. These various membranes must have been formed in a similar manner in the ancestors of the modern insects—that is to say, they were not called into existence by “use or disuse,” as the Lamarckian theory maintains; they arose before there could be any question of their use or functional activity, before the protective cuticle had even laid them bare. The newly formed or modified parts could not have any functional activity until they were already formed or modified. Thus the case of the insects proves the direct contrary of what Lamarckism asserts.

Similarly, instructive examples of coadaptation in passive organs to which the Lamarckian theory is inapplicable are adduced by Weismann.¹ If reasoning by analogy be permitted in biological science, we might assert that, if numerous cases of coadaptation and correlated variation can be adduced to which the Lamarckian theory of use and disuse is *not* applicable, and in which coadaptation must result from another cause than that of functional activity, seeing that the coadapted parts are precluded from entering into activity—at least, during the period of their modification; then it is more than probable that the coadaptation of *active* parts may also be explained without the aid of the Lamarckian theory. That the gradual development of the muscles, for instance, should have accompanied the gradual development of the antlers of the stag, and have been furthered in each individual life by constant use, due to the

¹ Weismann, *Vorträge über Deszendenztheorie*, ii. 70-75.

increasing strain, is extremely probable, seeing that use strengthens an organ. But the variation of the antlers themselves cannot be similarly explained, for the antlers are not active, but passive structures.

Having thus briefly examined the Lamarckian theory as applied to the transmission of mutilations and of instinct, and with reference to the phenomena of coadaptation, we are led to reject it all along the line as an hypothesis which is not merely unproved, but which stands, on the one hand, in contradiction to the facts; and which, on the other, is inapplicable, even were it true, to large categories of cases.

NOTE ON THE HEREDITARY TRANSMISSION OF EPILEPSY.

Since writing the above we have received a communication from Dr. Maurice de Fleury, than whom no one is more competent to express an opinion in regard to the hereditary transmission of epilepsy. Dr. de Fleury entirely confirms us in our scepticism as to the hereditary transmission of this disease. Speaking from personal experience of eighty-seven cases of epilepsy, Dr. de Fleury writes: "Never once have I observed that the parents were epileptic. On the contrary, I have always noted that they were *not* epileptic." Dr. de Fleury states explicitly that the children of epileptic parents are degenerate, and that an accident may cause the general pathological condition of such degenerate offspring to manifest itself as epilepsy. This confirms what we said above. In the same way a syphilitic patient may beget a child with a deformed skull who becomes epileptic. But this has nothing to do with the hereditary transmission of epilepsy itself, which Dr. de Fleury considers to be a non-transmissible disease.

NOTE ON INSTINCT.

It is frequently urged against Weismann's position that the instinct of the hound which causes it to remain motionless when in sight of game—an instinct undoubtedly hereditary—has been acquired under domestication, and has become so greatly strengthened by use in the course of successive generations that it is now inborn in the race. It is to be remarked, in the first instance, that this instinct is very differently developed in different individuals. The sportsman knows well how to distinguish, even in a litter, between the effective pups and the indifferent ones. In the second place, it must be remembered that the hunting instinct of the hound has not by any means been wholly acquired under domestication. This instinct is but a variation of the hunting instinct

which was doubtless inherent in the ancestors of the domesticated hound, as it is inherent in allied species of the canine genus ; and which is inherent because it is indispensable to the existence of the species. And just as the original hunting instinct is the result of natural selection, because it is an indispensable adaptation to given conditions of life, so the development of that instinct under domestication is the result of artificial selection, because the breeder treats it as an indispensable quality. The same holds true of the instinct of fidelity in the watch-dog, of docility in the elephant under domestication, etc. These instincts are not entirely novel acquisitions, but are modifications of instincts which were, in their fundamental form, characteristics of the species in question. The improved expression is the necessary outcome of readaptation to changed conditions.

A curious instance of the inefficiency of the Lamarckian theory of use and disuse as primordial factors in evolution is afforded by some poisonous or unpalatable species of butterflies which are invariably slow in their flying movements. We may exclude habit as a cause of this modification of movement, as there is no reason to be found in the external conditions which could have caused these butterflies to fly less quickly than their ancestors. Even if we suppose a few varieties to have been produced whose movements were slow, there is no Lamarckian reason why these varieties alone should have survived ; and still less why the movements should become ever slower in the course of succeeding generations. Only when we apply the interpretation afforded by natural selection do we get an explanation of this phenomenon. The varieties which arose with slower movement were more easily recognised by hostile birds than the quickly flying varieties, and were consequently more generally avoided on account of their unpalatable or poisonous qualities. Consequently, these slow-flying varieties survived in greater numbers, multiplied at the expense of their competitors, and bequeathed their instinct for slow movement to their progeny. The slowness of the movement will increase in the course of generations, as long as an increase is advantageous. Once the advantage of a greater sluggishness ceases, variation in that direction ceases also, and the species is adapted to its environment.

CHAPTER V

INSTINCT

MORPHOLOGICAL characters which are of utility to a species in the struggle for existence are due, as to their origin, to natural selection, and are transmissible by heredity. Such characters are, for instance, the colour of animals, and the varied and delicate arrangements for the protection of plants from unwelcome visitors. But psychological as well as morphological characters can be thus selected and transmitted. And we shall see that, unless certain morphological characters, certain animal colours, were invariably associated with corresponding instincts, those morphological characters would be useless to their possessor. There is thus a necessary correlation between the colour and the instinct of the animal; and even as the first is due to natural selection—we speak now of protective colouring, as distinct from the decorations due to sexual selection—so also is the second.

Between reflex action and instinct no strict separation can be established. On the other hand, a voluntary and conscious action can, under certain circumstances, become instinctive.¹ Instinct, as Spencer has defined it, is a complex series of reflex actions; and, indeed, when we consider the extraordinary precision of the instincts in many of the lower animals, we are apt to consider them from the human point of view, and to attribute to their possessors psychical faculties analogous to those of man.

¹ *Vide* in Chapter IV. the example of the walrus in the South Sea Islands.

This anthropomorphism, though deeply rooted in the human mind, is none the less deceptive and erroneous. Consciousness is a phenomenon which implies a certain development of the nervous system ; and the view which holds the centralisation of the nervous system in certain centres of the brain cortex to be the indispensable condition for the development of consciousness is certainly the correct one. Max Verworn has shown that all stimulated movements in the lower organisms and plants must be regarded as reflex, and that conscious and voluntary action commences only subsequently to the development of the specific nerve centres.¹

For this reason we are unable to agree with Ribot, who writes : " Cet état initial (de l'instinct) doit être accompagné de conscience, n'est possible que par elle : il est au sens strict, d'une nature psychique. Considérons maintenant les instincts dans leur dernier terme : dans les actes, les résultats auxquels ils aboutissent. Ici encore, il est difficile de ne pas admettre un état de conscience, surtout dans les cas où l'activité de l'animal doit parcourir plusieurs phases dont chacune n'est qu'une étape vers le résultat final."² Ribot goes on to say that the intermediary phenomena between the initial and the final act, which constitute instinct properly so called, are indeed unconscious ; for, as the nervous process is the only indispensable factor in the conscious state, it matters little if consciousness itself disappears in the course of time, provided that the nervous process which constitutes the physiological equivalent of consciousness remain.

Ribot's view is that instinct is nothing but inherited habit ; and although this may be true in a certain sense when applied to those instincts which have their origin in an act of conscious volition, Weismann has shown conclusively that it cannot be

¹ M. Verworn, *Psychophysiologische Protisten-Studien*, pp. 135-140.

² Th. Ribot, *L'Hérédité psychologique*, 7th edition, p. 18. Paris, Alcan, 1902.

applied to those instincts which take place but *once* in the individual lifetime, in which, therefore, there can be no question of habit; nor to those instincts which occur among the sterile worker bees and worker ants, in which there can be no transmission. In the same way, when Ribot adds (p. 19), "A mesure que les divers états physiologiques, d'abord accompagnés de conscience, sont devenus plus rapides, mieux coordonnés, la conscience s'est retirée d'eux, en sorte que ce mécanisme si régulier ne représente plus aujourd'hui que de la conscience éteinte," it is somewhat difficult to see how this can be applied to certain cases in which the necessary degree of intelligence is lacking; and in which the elaboration of an act of volition would, under the circumstances, take too long for the individual to escape destruction. For instance, let us take the case of a butterfly whose instinct causes it to fly upwards and in the opposite direction when the shadow of an approaching object stimulates its nervous mechanism. It is impossible for the butterfly to know what death is, for it has never experienced it, and it possesses no reasoning powers capable of replacing personal experience. It is likewise impossible for the butterfly to develop an act of volition in such a brief but critical moment. Consciousness and volition presuppose, when combined, reflection; and if the butterfly, supposing it to be capable of so doing, had first of all to reflect, to establish a correlation between the approaching object and the phenomenon of death, and then, as a result of such reflection, to *will* the act of flying away; it is more than probable that the object in question would have pounced upon it before this relatively elaborate psychical process had been completed. To suppose consciousness at the basis of the instinct of the butterfly to fly from an approaching object, is to assume the butterfly in possession of a knowledge of causality sufficient for it to be able to establish a correlation between the approaching object and danger for itself; this is assuredly giving the butterfly credit for more intelligence than it possesses.

The difficulty is avoided if we seek the origin of animal instinct in natural selection, and if we are content to see in instinct a case of adaptation—not of conscious, but of unconscious adaptation—called forth by the elementary necessities of life itself. Reflex action is admitted by all to be unconscious. The closing of the eyelids when the retina is suddenly struck by a vivid flash of light, or stimulated by the movement of a rapidly approaching object, is purely reflex and automatic. The light which strikes the retina stimulates the sensory nerves at the periphery, and this stimulus is communicated by the nervous channels to certain cerebral centres, from which it is communicated to the periphery, where it manifests itself in an act which is nothing but the reaction of the organism to the original external stimulus. The life of the individual, whether organic or psychical, is but a sum of reactions to the stimuli of the environment. According to Spencer, it consists in a correspondence of the individual with the environment; and this sum of actions and reactions which make up life constitutes a continual adjustment of internal to external conditions.

When we gain some insight into the mechanism of nervous reaction, we are in a better position to understand the nature of instinct. The same material basis—that is to say, the nervous system—serves as a condition of both reflex and instinctive actions. The wasp which is instinctively aware of its victim—a grasshopper or a certain caterpillar—which attacks it, paralyses it with a sting, drags it into its retreat, places it in one of the cells which it has already constructed for the future progeny, lays an egg on top of the insect, and closes the cell—this wasp, which exhibits so wonderful a succession of acts all tending to the same end—the providing of food for its progeny—is merely obeying the dictates of its nervous system. For instinct is but a succession of reflex combinations, the first act determining the second, the second determining the third, and so forth. Every instinct has its origin in an external stimulus acting on

the sense organs, which stimulates the peripheral nerve endings, the sensory nerves communicating with the cerebral centres, the cerebral centres themselves, and finally the motor nerves going to the periphery.

The instinct of self-preservation is of all instincts the most widely and perfectly developed ; and this obvious fact is entirely in harmony with the theory of selection, self-preservation being the first necessity of life. In the majority of cases consciousness cannot even be considered as a possible factor in the origin of these self-preservative instincts ; for it is evident that it is not consciousness, but *impulse*, which causes the butterfly, as soon as it has left the chrysalis, to fly from an approaching object ; which causes the chicken, as soon as it has been hatched, to pick up seeds ; which causes the young kitten to chase the mouse. For, as we have said, the butterfly can have no knowledge of death, nor can the chicken possibly know by experience that seeds are edible, nor the kitten, which has never seen a mouse, that the mouse is its natural prey. The butterfly flies, the chicken picks up seeds, and the cat chases the mouse, because these external stimuli set in motion certain brain centres which are so constituted that they respond to these stimuli and not to others.

The instinct of a female butterfly to deposit an egg is awakened only by the sight and scent of certain plants. The appetite of the caterpillar, its instinct for taking food, is likewise excited by certain plants. Place the silkworm on a mulberry-leaf, and it will thrive ; place it on the leaf of a beech-tree, and it will die of starvation rather than eat ; and this although such a leaf would not be in any way poisonous for the silkworm, but simply because the instinct to take food is not awakened by the beech-leaf, whereas it is awakened by the mulberry-leaf. Many species of caterpillars thrive only on one sort of leaf, and a certain beetle species is attracted solely by the deadly nightshade, *Atropa belladonna*, which is poisonous for other species. The instinct

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of these beetles in regard to egg-laying is so regulated that it co-operates with the instinctive appetite of the larvæ for the *Atropa belladonna*; and the eggs are invariably deposited in such a manner that the larva can be sure of immediately obtaining food when it breaks through the egg. It must obviously be a great advantage to this species that its food substance is not shared by any rivals, for thereby the severity of its struggle for existence is considerably—indeed, very greatly—diminished. Several species of caterpillar are likewise monophagous—that is to say, they subsist on a single species of plant. It may be asked how such an instinct could be developed, unless consciousness be at its origin? The reply is that the species in question are too low down on the scale to be able to correlate cause and effect; that they are unable to judge of what is good or not good to eat; and that, as a matter of fact, they are undoubtedly able to eat other plants than the specified one in each case. Such an instinct as the monophagous instinct can only have arisen as a result of selection. Utility for the species being the *raison d'être* of monophagy, selection must gradually have eliminated those individuals which did not possess this instinct; with the result that the determinants of that instinct have become ever more and more fixed in the germ-plasm of the species.

In many cases we find a correlation of colour and instinct which cannot be explained otherwise than as the result of selection. Thus, for instance, the butterfly *Xylina* resembles, in its colouring, a broken-off and decayed piece of wood; and this extraordinary colouring would not avail the animal unless it were accompanied by the instinct to lie perfectly still, with feelers and legs drawn in against the body, until danger is past. There are hundreds of other instances of this correlation of instinct and colouring which could be cited, and which show us that these self-preservative instincts—for such, in the case of *Xylina*, is the instinct to be still—are the results of natural

selection. For if we admit natural selection to be the cause of the morphological adaptation in the interest of the species, it is impossible to admit another origin for the correlative psychological adaptation, without which the former would be absolutely useless. And not only is the instinct to be still a result of selection, but also the instinct—of perhaps even greater importance—of invariably choosing its habitat among the leaves whose colouring corresponds to its own.

There are also instincts among unicellular organisms in regard to which consciousness may be entirely excluded as a factor in their origin, for the organism is far too primitive for such a psychical development to be thought of. Such is the instinct of conjugation, as in the case of the Infusorians studied by Professor Ischikawa. Of a similar nature are those extremely interesting phenomena of nuclear conjugation which characterise some of the simplest organisms—for instance, the *Coccidium proprium*, a cell parasite of the salamander—which are nearly as complicated as those to be found in the higher multicellular organisms. The instinct to conjugate must be exclusively the result of natural selection, since these micro-organisms are too low down in the scale for consciousness to be thought of.

We have already seen, in considering the Lamarckian hypothesis of the inheritance of functional modifications, that several categories of instincts cannot be explained as “inherited habits,” either because the concept of habit is irrelevant, as in the case of instincts which manifest themselves only once during the lifetime of the individual; or because hereditary transmission is impossible, as in the case of the sterile types with highly developed instincts, such as the worker ants. But if we consider once more the case of those instincts which are manifested but once in a life-history, we find that *consciousness* may possibly have had a share in their origin. The caterpillar which spins a silky thread round its thorax in order to hang itself from a wall or from a tree during the chrysalis stage must spin it so that it

falls in the centre of the wing apparatus of the butterfly which is going to be developed—not too loosely, for there would then be a danger of the chrysalis falling out, and not too tightly, for the excessive compression might be fatal to further development. There is here a succession of complicated instincts, one merging into the other, and it is probable that consciousness may have originally operated in establishing this succession. In the case of a succession of complicated actions consciousness may be admitted as a factor, although only at the origin ; for whenever this complicated instinct, or, rather, series of instincts, becomes fixed in the germ-plasm of the species, it passes from the conscious to the unconscious level.

It may be objected that this contradicts what we have previously maintained. This, however, is not the case. What we have combated is the view which regards instincts as “inherited habits”—a view which, as Ribot holds, supposes the initial and final stages of every instinct to be accompanied by consciousness ; in a word, which declares consciousness to be the necessary factor in the origin of *every* instinct. It is true that there is more than one definition of consciousness, but Ribot has expressly declared it to be a “psychic element,” thereby indicating his acceptance of the usual meaning. We do not deny that there are numerous cases of instincts in the genesis of which consciousness has played a *rôle*, and an important one—as, for, instance, in complicated successions of actions, each one adapted to a definite end. It is difficult to conceive of the origin of these without consciousness. These instincts are to be reckoned in the category which we discussed in our remarks on the Lamarckian hypothesis ; they have originated in an act of conscious volition ; they are voluntary acts which have become instinctive in the course of generations.

But outside of this category there are multitudinous instincts, less complicated in their nature, which are completely unconscious. We have considered several of these cases, in which

it is quite unnecessary to seek an explanation in consciousness, and we have seen that they are due solely to the action of natural selection acting on certain nerve centres. But, apart from these cases, there are others which perhaps show more clearly the rôle of natural selection and the absence of conscious volition.

Such are those interesting cases in which the instinct, already present in a general form, is not specialised beyond the strict limit of vital necessity to the species, beyond which selection has no motive for favouring its development, although we might consider such a development to be, if not necessary, at least advantageous. There is a species of beetle, *Sitaris humerales*, belonging to the family of Cantharidæ, whose larvæ show apparently no immediate instinct for taking food, but which fasten upon a certain bee, whose egg—if the bee be a female—they subsequently eat. If the bee, however, be a male, or if the larvæ fasten upon another insect which is not a bee at all, the larvæ must in either case perish for lack of sustenance. Now, if the instinct of the species were more developed, so that, instead of its nerve centres being excited by the approach of *any* bee, they were only excited by the approach of the female bees, it is certain that a much greater number of larvæ would survive and become full-grown beetles than is the case at present. We must suppose that the present degree of development of the instinct is, nevertheless, sufficient for the maintenance of the species, and that there is no reason why natural selection should favour greater multiplication of individuals. This case shows us, however, that we have not to deal with conscious volition. For if conscious volition had dictated the process of fastening on to the bee, there is no reason why the instinct should not eventually have become specialised to the degree of causing the nerve centres to enter into activity *only* at the approach of a female bee.¹ Obviously, the aid of the Lamarckian doctrine of use and disuse might be

¹ Not to mention the fact that conscious volition is excluded as a hypothesis in the case of a larva.

utilised in this case to explain "this specialisation by constant use." On the other hand, the partial and incomplete nature of the instinct is easily explicable if we suppose selection to have originated it. Just as a machine can only work with the material for which it is constructed, so an instinct can only induce an appropriately adapted action when the animal is living under natural conditions. The specialisation of any given instinct has its limits; and this limitation implies the necessarily limited utility of such specialisation for the species. We may say, however, that, in so far as the interest of the species requires specialisation of any given instinct, natural selection will secure that specialisation. The evolution of an instinct, whether its origin be conscious and voluntary or not, is always the work of selection, and is, consequently, unconscious and independent of the will.

The last case of instinct which we shall notice is that exhibited by the sea-cucumber, *Cucumaria*, in taking food. The tentacles, ten in number, each with numerous branches, are well adapted for catching small animals; and numerous larvæ of different kinds, besides Infusorians and the like, come and settle on what looks like a bush of seaweed. The cucumber, however, moves its tentacles continuously up and down; it brings the tip to its mouth, slides the tentacle slowly down the gullet, and then withdraws it, having "cleaned off" all the little living creatures which are forthwith digested. This mechanical movement is one of the few signs of life which the sea-cucumber exhibits; and the animal, being quite without nerve centres, cannot be credited with volition, or even with consciousness. Its feeding instinct is entirely automatic. In the same way, certain deep-sea fishes have their eyes, not at the side of the head, but on the top; and the jaws are so constructed that they open upwards instead of downwards. These fishes have an instinct for catching prey in correlation with this morphological peculiarity. They bury themselves in the sand, so that nothing remains visible except their eyes; in this position they await the approach of a victim,

which they then seize by a rapid movement. But this refinement in the catching of prey is purely instinctive; the fish acts, not as the result of reflection, but when its instinct is awakened by the sight of a victim. The *utility* of this behaviour is quite unknown to the fish, which acts automatically in response to an external stimulus affecting its sense organs. The psychical factor, which Ribot sees in the original elaboration of every instinct, is absent in the case of these fishes, as it is absent in the case of the sea-cucumber. In both cases it is natural selection which has evolved the instincts, and adjusted an appropriate reaction to an external stimulus.

CHAPTER VI

THE BIOLOGICAL IMPORTANCE OF AMPHIMIXIS

THE more ancient an organic character is, the more persistent is it. The characters of a genus are more persistent than the characters of a species, and the characters of a species more persistent than individual characters. This implies that the determinants of a given organic character are more or less numerous according as this character is more or less old. A recent adaptation to new conditions has as its antecedent condition a corresponding change in a majority of determinants in a majority of individuals; but there may remain a strong minority of unchanged determinants; and should the conditions be unstable, an oscillation in the germinal nutrition may bring the determinants of the new variation once more into a minority. On the other hand, the determinants of a character which has long been adapted have gradually gained so great a preponderance, and have so enormously increased their assimilating power at the expense of that of their neighbours, that such a character, even if its environment change, may nevertheless continue for a long time unchanged. An instructive example of this persistence of long-established and firmly rooted characters is furnished by various species of wild plants placed under domestication. Such a wild plant may resist, during several successive generations, all the influences of greatly modified conditions, and remain unchanged; only after a prolonged period do a few variations begin to manifest themselves. The determinants of the original constitution of the

plant are so stable that they can thus remain unaffected by complete changes of environment.

This remark is intended as an introduction to a consideration of the biological importance of amphimixis. Amphimixis consists in the meeting and mingling of two nuclei. We cannot say of amphimixis that it is necessarily bound up with multiplication; for in the conjugation of two unicellulars, which is the lowest form of amphimixis, the immediate result is that two individuals become one. This amalgamation is, indeed, followed by fission, but cannot be said to be the cause of it, as fission is of frequent occurrence without any preceding conjugation. Indeed, conjugation often occurs at long intervals in the series of successive fissions.

Nor can we say of amphimixis that it has, not merely a fertilising, but also a "rejuvenating" effect; and that without it a species must, in the long run, die out in a sort of sexual decrepitude. The experiments of Weismann appear to contradict the theory of Maupas on this point. But that amphimixis is in some way of the highest importance is shown by the fact that it is associated with reproduction in the great majority of cases throughout the entire organic world.

The fact which we have mentioned above, as to the relation between the age of a character and its power of persistence, gives us the clue to the extraordinary persistence of amphimixis throughout the animal world. Those determinants of the germ-plasm which determine this particular character of the sex-cells must be the most obstinately persistent determinants in the germ-plasm of the species—more persistent even than the determinants of specific characters themselves; for amphimixis is more ancient than the species of to-day, and was probably characteristic of their earliest ancestors. So that, even if natural selection did not continue operative in securing the persistence of this phenomenon, we can still understand how it is possible for amphimixis to have persisted through hundreds of thousands

of generations ; since the species themselves would have to disappear before amphimixis could disappear.

Thus the objection that, as amphimixis does not directly benefit the individuals of the species which exhibit it, therefore natural selection is not interested in its maintenance, and therefore amphimixis is not exclusively a product of selection, omits to take certain factors into consideration. Natural selection, it is said, cannot interest itself (metaphorically speaking) in the maintenance of a character which is not directly useful to the species ; and it cannot be said that the usefulness of amphimixis is anything but intermittent and indirect, in so far as its *raison d'être* is the adaptation of the species to new conditions. Adaptation to modified conditions takes place but once in every thousand generations, or even less. On the theory that functional use or disuse strengthens or weakens a function, we can suppose amphimixis to exist simply because of the vast reserve of force which its long functional activity has necessarily accumulated ; but if the transmission of functionally acquired modifications be denied, how can we explain why amphimixis has persisted as it has, if selection alone be responsible for it ? and if, furthermore, the hypothesis of amphimixis as a rejuvenating factor be rejected ? During the thousand generations or more which elapse between successive adaptations of species, what force can selection exercise on the maintenance of amphimixis ? When the species enters into a period of instability due to the changes in the environment, then amphimixis will doubtless play an important *rôle* in adapting the species to the modified conditions ; and, as amphimixis is then of direct benefit to the species, natural selection will favour its recurrence ; but in the vast periods which intervene between these crises of instability due to readaptation, what reason has selection to favour the maintenance of amphimixis ?

This objection is based upon the assumption that in the intervals between the periods of readaptation amphimixis has no

importance for the species in the struggle for existence. But we have seen that the determinants of the germ-plasm of every individual are variable; that perturbations of the intragerminal nutrition are perpetually causing a "shifting of the balance" in the interior of the germ-plasm; that such minimal variations caused by nutritive oscillations can progress until selection value is attained—that is to say, until they attain to sufficient importance to influence the life of the individual. Unless natural selection then intervenes, the individual, which has come to be out of harmony with its environment, is exterminated. It is true that many of the variations thus caused by nutritive perturbations are checked by intragerminal influences before they attain biological value; but many others are not thus checked, and must be a danger to the species, if not checked by selection. And as such variations are perpetually arising, selection must be perpetually ready to check them.

Let us take a species which is adapted to certain conditions, and suppose no amphimixis to occur. Adaptation is the result of the harmony of a great number of characteristics with surrounding conditions; and variations of one or more of these characteristics, in numerous members of the species, must inevitably be of frequent occurrence. Amphimixis, by the constant mingling of different ids and the constant renewal of the germ-plasm which ensues, is able to keep these spontaneous variations in check; if no amphimixis occurred, then every such variation would necessarily attain biological value, and the species could only be maintained by the destruction of the individuals possessing these variations. But such destruction would soon cause the normal number of the species to dwindle; or else the whole species would, little by little, vary so greatly in the majority of its individuals that it would fall a victim to this want of harmony with its environment. Excessive variation would be, without amphimixis, an uncontrollable factor in the extermination of species; but through amphimixis intragerminal variations can

be checked before they become excessive—that is to say, before they attain biological value. Thus we see that amphimixis is always and at all times a necessary factor in maintaining the steady and constant adaptation of a species at every moment of its existence. As adaptation is synonymous with organic life—for we cannot imagine life which is non-adapted—and as amphimixis, where it exists, is the chief factor in effecting and consolidating adaptation, we can understand that the determinants of amphimixis are very stable—even more stable than the specific determinants of the species.

What we have said enables us to understand that amphimixis has especial importance as an equaliser of differences, as a guarantee of the constancy of the species. Through the uninterrupted activity of amphimixis, we get a centre-point which represents the biological average of a given species, around which are to be found concentrated the great majority of the members of that species; while the variations which diverge from the biological average become less and less numerous as they approach the limits of the possible vital conditions of the species. For instance, to take only one characteristic, the height of the human body varies around an average, the variations becoming less and less numerous according as they diverge further and further from this average, until finally the limit of the biological conditions is reached, beyond which no human life is possible. As height is not a very vital characteristic, it does not show a narrow “variation limit”—to use Ammon’s expression¹—but it is obvious that too small a dwarf or too gigantic a giant could not survive.

Galton has particularly insisted on this tendency of amphimixis to establish a centre-point, or biological average, representing the general character of the species, personified by the majority of that species. We may represent this tendency of amphimixis by any curve (Fig. 5). C represents the lowest, D the highest,

: O. Ammon, *Der Abänderungsspielraum*, in *Naturwissenschaftliche Zeitschrift*. Berlin, Nos. 12-14, 1896.

limit of variations, so that the semicircle DAC constitutes the "variation limit"; AB represents the line of greatest frequency—that is to say, the greatest number of individuals remain, in their biological constitution, at an equal distance from the two poles C and D. AB may also be described as the "line of constancy" of the species, or as the "line of normality," the constancy of a species being calculated on the constancy of the greater number of its component individuals; and the normality of a type being that exhibited by the great majority of individuals, the abnormal types being represented by a minority. In the symmetrical curve, where AB represents the line of greater frequency or normality, the variations from this biological average diminish in

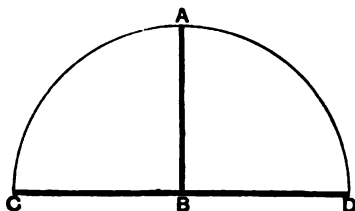


FIG. 5.—SYMMETRICAL FREQUENCY CURVE.

C, Lowest, D, highest limit of variation; AB, line of greatest frequency.

number while increasing in amount, in proportion to the distance which separates the line of normality from the poles C and D, the largest number being near the line AB, and the smallest number at the poles.

Although symmetrical curves are by far the most frequent, there are also asymmetrical curves, as in Fig. 6. Whereas in the symmetrical curve the line of constancy falls upon the line of normality, in the asymmetrical curve the line of constancy (. . . .) representing the centre-point of equilibrium between the limits of variation is not coincident with the line of normality or greatest frequency (*aB*). That is to say, the species is in the paradoxical position of having its line of constancy separated

from its line of normality ; in other words, it is only a *minority* of individuals who possess the organic characters which, in their totality, represent the biological equilibrium of the species ; the majority have varied in a greater or less degree, and in a direction which disturbs the biological equilibrium by tending to bring the species out of harmony with its actual vital conditions. The result of this state of affairs must either be a readaptation of the species to new conditions, or the gradual extinction of the species. Asymmetrical curves are realised whenever, in response to a change of external conditions, the germ-plasm of the majority of individuals of a species enters into a period of instability and variation, pending the consolidation of readaptation.

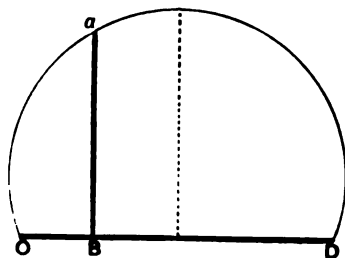


FIG. 6.—ASYMMETRICAL FREQUENCY CURVE.

The causes of asymmetrical curves, according to Ammon, are three in number : firstly, when the fertility of the species shows a tendency to increase among those groups of individuals which are nearer the limits of variation ; secondly, when germinal selection tends to increase the rate of variation in a given direction towards one or other of the poles ; and thirdly, when natural selection intervenes in unequal proportions at one or the other of the poles. It may be remarked that the first cause is itself an effect of the second one ; and the rôle of natural selection will be different according as the variation is useful to the species or not. If it be a variation tending to readapt the species to a changed environment (to which the species is biologically adaptable), then

natural selection, through amphimixis, will favour the variation by effecting the adaptation of an ever greater number of individuals to it ; if, on the other hand, the variation be one which cannot result in readaptation, then either the symmetrical curve will have to be re-established (extermination of the variation), or the species will continue to follow the asymmetrical curve (extermination of the species).

Thus, one of the most important effects of amphimixis is the consolidation of the constitution of the species ; for the asymmetrical curve is the exception, and the symmetrical curve is the rule. One of the chief reasons, therefore, for the continuous persistence of amphimixis is that it secures the greater constancy of a species, and at the same time facilitates its readaptation to changed conditions.

It must not be supposed—though the belief is very general—that there is an antithesis between constancy and adaptation. The constancy of a species is secured by amphimixis, as is shown, for instance, in the case of the wild plant transported to a new environment—that of cultivation. Amphimixis secures constancy by eliminating a number of variations which would otherwise prejudicially affect the species, and by enabling the species as a whole to resist small changes of environment. On the other hand, without amphimixis it would be impossible to secure so general an adaptation to greatly changed conditions—an *adaptation which is in the interest of the species itself*, and without which it would be eliminated. In each case amphimixis ensures the continuity of the life of the species ; and is an indispensable factor in the struggle for existence.

It is essential to consider amphimixis in the light of its two main effects, not only maintaining the constancy of the species, but also increasing its adaptability ; both of these effects being necessary corollaries of the *raison d'être* of amphimixis as an instrument for the conservation of the species. The probable advantage of amphimixis, as Weismann remarks, lies, for the individual, in the

fact that, through its agency, organic defects in either of the parental individuals are remedied ; thus, an individual A may possess stronger digestive biophors than an individual B, who, on the other hand, may possess stronger nervous biophors than A. The product of the mingling of the germ-plasms A and B will thus profit by the better digestive apparatus of A and the stronger nervous system of B. The direct individual advantage is more obvious in plastogamy—i.e., the mingling of the *protoplasm*, not of the nuclei, of two cells, as in the case of certain Protozoa. It is obvious that if one organism suffers from defective secreting biophors, the other from defective digestive biophors, the conjugation and subsequent mingling in a single individual must be beneficial to both, provided the one organism possesses what the other lacks.¹

The direct value of amphimixis to the individual, as in cases of plastogamy, must have been the fundamental reason for its introduction into the organic world. But, leaving the question of the primary origin of amphimixis, which has no practical importance for us in this study, let us turn to amphimixis in its relation to the human species.

The human species, as far as the deeper traits of its constitution are concerned, is constant ; but this constancy does not prevent a slow and steady variation, especially of the more passive

¹ Plastogamy, as one of the stages leading on to amphimixis, is a highly interesting phenomenon, which was first observed in amoeboid organisms. About fifty of these microscopic animals were observed forming a sort of nest, lying close to one another, without joining together. Although no apparent result follows from this "cytotropism," or mutual attraction of identical cells—a phenomenon first studied by Wilhelm Roux—it is obvious that some advantage must result to the individuals thus brought together. Cytotropism may help us to understand the evolution of the phenomena of the blending of nuclei (amphimixis).

Weismann describes a slightly higher stage as plastogamy—namely, the case of certain Protozoa in which there is a mingling of the cytoplasm, and not of the nuclei. There is, however, no essential difference between this blending of the cytoplasm and the simple cytotropism observed among the Amœbæ.

parts of the human organism. A considerable number of organs and parts of organs are in steady regression—for instance, the eleventh and twelfth ribs, the wisdom teeth, the appendix vermiformis of the intestine—and although it is obviously difficult to affirm in any concrete case that similar variation is taking place among the active parts of the organism, there is no reason why this should not be the case. It is believed by many that the increasing histological differentiation of the cortical zone of the human brain is among the “active progressive variations” which the species is undergoing at the present time.

And such cases of regressive variation in passive organs, and of progressive variation in active ones, are plainly cases of adaptation; and it is equally clear that regressive variation of useless—consequently passive—organs could not take place simultaneously throughout the whole human species, as it does, were it not that amphimixis “spreads far and wide” the minus variations of these organs, the retention of whose determinants in the germ-plasm would, as we have said in the chapter on Germinal Selection, be fraught with danger to the species. The most constant species never remain wholly unaltered. Change and movement are the laws of organic life, and everywhere we find species involved in a process of perpetual Becoming—throwing off that part of the ancestral legacy which has become cumbersome under altered conditions, perfecting the most useful organs and parts towards fitter adaptation and greater utility, improving the co-ordination of the various parts. During this period of increasing adaptation amphimixis is indispensable, for it is ever disseminating the plus variations of those parts which require to be increased. This indispensable result of amphimixis is sufficient to ensure that natural selection will retain it, even if it were not sufficiently guaranteed against disappearance by the mere power of persistence possessed by the sexual determinants—a power which is due, as we have seen, to the vast length of the period during which amphimixis has existed.

Another point to be noticed in regard to the biological rôle of amphimixis is the extraordinarily minute adaptation of the two conjugating cells to one another ; and the consummate art with which Nature has effected these adaptations shows us once more the very great importance of amphimixis as a biological factor. In the simplest cases the conjugating cells are identical both in size and in appearance ; subsequently a difference in size begins to manifest itself, and eventually there are always dimorphic micro- and macro-gametes, or, as we term them, male cells and female cells. The difference between these two kinds of cells becomes more and more accentuated as we ascend the animal hierarchy. The egg is bulky, with little locomotor power, substantially equipped with nutritive material. The sperm-cell, on the other hand, is small, extremely mobile, devoid of nutritive reserves, and consequently incapable of independent life ; its utility for the egg lies in the fact that it introduces the centrosome, the dynamic centre in the karyokinesis of the fertilised egg. And then come the countless different adaptations of both the egg and the spermatozoon in relation to different conditions of life in different species—adaptations in respect to the organism and in respect to each other ; and all these variations, which involve the minutest details, show us better than anything else the importance of amphimixis as a biological factor : for they show us, to speak metaphorically, the pains which natural selection has taken in order to ensure its persistence.

To sum up : The biological importance of amphimixis, for those species which exhibit it, lies in its double effect of promoting constancy and increasing adaptability. The constancy of species is secured by an equilibrium established between the species and its environment ; and we have seen that amphimixis tends, by eliminating variations diverging from the line of equilibrium, to make normality coincident with constancy. On the other hand, when the conditions change, and the species is confronted with the alternative of readaptation or extinction, amphi-

mixis is an essential factor in effecting readaptation; for it disseminates the variations which are most adaptive. Thus the retention of amphimixis by natural selection is justified; for amphimixis is a factor, and, we must conclude from its widespread occurrence, a highly important factor, in the conservation of species. In a word, as constancy can only be secured through adaptation and readaptation, we may say of amphimixis that it is the biological instrument of adaptation.

NOTE ON THE SELF-FERTILISATION OF PLANTS.

It is remarkable that among plants a seemingly contradictory phenomenon is observable. On the one hand, the countless structural adaptations which favour crossing seem to show that crossing, if not indispensable, is at all events advantageous; on the other hand, a small number of plants reproduce exclusively by self-fertilisation, and show no sign of degeneracy. On the one hand, again, we find a number of plants capable of being fertilised by their own pollen, and others on whom the action of their own pollen produces decay or sterility.

It is probable that this apparent contradiction is due, as Darwin says, to the nature of the sexual elements, and not to any difference in their structure or general constitution; or, as Weismann puts it, it is a phenomenon of adaptation. In other words, the fecundity or sterility of a plant after fertilisation by its own pollen will depend upon the degree in which the stigma and the pollen are adapted to harmonious co-operation. Darwin has observed that several causes may contribute to the sterility of first crosses, and several of these causes must be operative in the case of self-fertilisation in plants. For instance, "there must sometimes be a physical impossibility in the male element reaching the ovule, as would be the case with a plant having a pistil too long for the pollen-tubes to reach the ovary. . . . Or, again, the male element may reach the female element, but be incapable of causing an embryo to be developed." In what particular way the constitution of a plant is so adapted that fertilisation by its own pollen is impossible, is a question which must in each case be left for botanists to answer.

The case of those plants which reproduce exclusively by self-fertilisation should suffice to refute the theory that amphimixis is a "rejuvenating" factor, indispensable to the continuance of life, and not merely an advantageous adaptation. But the fact that the self-fertilisation of plants produces satisfactory results cannot be taken as an argument in favour

of consanguinity. Self-fertilisation differs also from parthenogenesis, since, unlike the latter, a steady diminution of the number of heterogeneous ids must be its result; it is true, on the other hand, that both self-fertilisation and parthenogenesis have an advantage, as compared with consanguinity, in that they do not permit the introduction of unfavourably affected ids into the germ-plasm.

CHAPTER VII

CONSANGUINITY

WE have seen that the biological value of amphimixis lies in the continuous renewal of the germ-plasm of the different individuals of a species. This renewal secures the timely suppression of a number of variations which would otherwise prejudicially affect the stability of the species. Moreover, by disseminating those determinants whose variation tends to secure an ever greater equilibrium, amphimixis contributes likewise to stability by rendering readaptation possible, and by consolidating adaptation already partially secured. We were led to reject the theory of amphimixis as a "rejuvenating" factor; and we must also dismiss the theory which attributes to amphimixis a mysterious "formative power," since there are cases in which a species continues exclusively by parthenogenesis. If amphimixis involved a formative power, it is difficult to see how such parthenogenetic species could survive.

If the constant renewal of the germ by the continuous mingling of heterogeneous germ-plasms be advantageous to the species, it might be inferred that consanguinity is biologically harmful to the species in which it occurs. This, however, is not necessarily the case, as we shall see. In the meantime, we may be better able to understand how consanguinity might have a prejudicial influence if we compare the result of amphimixis in the case of exogamous pairing with that in the case of endogamous pairing.

The result of amphimixis in exogamous pairing, is to import into the germ-plasm of the product ids of heterogeneous type—

namely, those of the mother and of the father. By this continuous mingling of individual germ-plasms amphimixis is perpetually effecting a renewal of the germ-plasm of the species ; eliminating those fortuitous variations which are out of harmony with the constitution of that germ-plasm, and disseminating those variations which are beneficial. Thus the value of such continuous mingling is at once a negative and a positive one. In the case of consanguinity, when both the parents belong to the same family, amphimixis does not bring about a renewal of the germ-plasm by the importation of new elements. It is true that the germ-plasm is perpetually renewed, but with the same kinds of elements ; and as every fresh amphimixis brings in a fresh lot of ids homogeneous with those already existing, in the course of time a certain monotony must set in in the germ-plasm, due to lack of variety in the nature of the ids composing it. Eventually the germ-plasm will be exclusively composed of identical ids.

Now, it may very well happen that some of the ids composing the germ-plasm of the family possess a majority of determinants which have entered on a period of unfavourable variation. In the ordinary course of events such ids would be counterbalanced by the introduction of foreign elements. In the case of an endogamous race, supposing the variation to have set in among a considerable number of individuals, and supposing only a limited number of identical kinds of id complexes to compose the germ-plasm, this unfavourable variation will be inherited from both sides ; and the degree of unfavourable variation will continue to increase as the number of identical ids with unfavourable variation determinants increases. It is obvious that in the germ-plasm of a family where constant intermarriage has been long the custom the ids must become increasingly identical ; and in such a family unfavourable variations have an infinitely greater chance of propagating themselves than in a family practising exogamy.

If we take a family which has long practised consanguinity, and suppose the number of heterogeneous ids in the germ-plasm

of the family to be reduced to six in number ; and suppose one of these to possess a majority of unfavourably varying determinants in the case of a few members—even of a single member—of the family ; and suppose, further, another id complex by another individual likewise to possess an unfavourable variation, and a third and a fourth id complex to vary unfavourably in other individuals ; the continuous intermingling of the nearly identical germ-plasm of these individuals cannot but tend to disseminate the various unfavourable modifications, to combine them in the same person and in an ever greater number according as the consanguineous intermingling goes on. Eventually these unfavourably varying determinants, brought together in ever greater numbers in the germ-plasm of the same individual, will effectually “swamp” the germ-plasm of the family ; which will be condemned to extinction unless foreign ids come to renew its germ-plasm by means of exogamy.

This theoretical explanation, which may help us to understand the reason for consanguineous degeneration, must not be understood as implying that consanguinity is in itself a necessary cause of biological degeneration. It is, indeed, popularly supposed that consanguinity *in itself* is harmful to those species or races or families which exhibit it. This, however, is by no means the case. Where an unfavourable variation, through one cause or another, *already exists*, consanguinity tends to favour its dissemination and increase, and in so far consanguinity is a frequent cause of degeneracy. But in the case of a very old and constant species, thoroughly adapted, consanguinity may continue without any unfortunate results. As Delage says : “La consanguinité additionne les tendances généralement similaires des conjoints ; en elle-même elle ne paraît avoir ni inconvénients ni avantages ; tout dépend de l'état individuel de ceux qui la pratiquent.”¹ Weismann also remarks : “Every case of con-

¹ Delage, *L'Hérédité et les grands Problèmes de la Biologie générale*, p. 270. Paris, Schleicher, 1903.

sanguinity does not necessarily involve degeneracy, for the latter presupposes unfavourable variations as its antecedent condition. As long as such unfavourable variations do not set in, no degeneration can result from consanguinity. This is confirmed by the fact that the harmful results of consanguinity are shown by experience to vary greatly in intensity, and may even be completely absent."¹ The most remarkable cases of degeneracy caused by consanguinity are those produced by the artificial breeding of wild races, which are not only subjected to continuous unnatural endogamy, but which are also protected against the consequences of the artificial conditions under which they live.

Instances of a race surviving long periods of consanguinity are not very frequent, and it is difficult to get secure data as to the length of time during which these generations have prevailed. On the other hand, there are not a few parthenogenetic species. It is likewise impossible to ascertain how long such species have remained exclusively parthenogenetic, but it is easier to understand the persistence of a parthenogenetic species than of a consanguineous one. The id complex of a parthenogenetic species retains all the ids derived from the common ancestor. The number of these ids does not diminish in quantity, for the second maturation division does not occur in the case of parthenogenetic eggs, and it will be remembered that the second maturation division is the one which effects the reduction of the chromosomes to one-half their normal number. And, on the other hand, if parthenogenesis does not allow of the renewal of the germ-plasm, neither does it allow of the importation of constitutional defects, as consanguinity does. If certain members of a parthenogenetic species show a tendency to vary in an unfavourable direction, such individuals are eliminated without having had a chance of disseminating the determinants of these unfavourable variations. Thus, a parthenogenetic species from

¹ *Vorträge über Deszendenztheorie*, ii. 195.

which amphimixis is excluded can maintain itself as long as any members of that species survive, for these will go on begetting progeny which are free from inherited degeneracy.

It is very difficult to say with any degree of certainty how long the species which we know as parthenogenetic have been in this condition. Weismann reared eighty successive generations of *Cyprus reptans* without producing a single male individual, which seems to show that the view which interprets amphimixis as a necessary "rejuvenating" factor is incorrect. On the other hand, in other cases of parthenogenetic species, a male occurs from time to time, which would seem to show that the institution of parthenogenesis is not in these cases of very ancient origin. The persistence of the *receptaculum seminis* in the females of some parthenogenetic species shows that after more than one hundred generations have elapsed since the functional use of an organ, this organ nevertheless remains. This proves that the intragerminal variations which lead to the regression of useless organs are purely fortuitous; but when such an accidentally produced regressive variation of an organ which is biologically indifferent to the species sets in, natural selection does not set any obstacle in the way of its further progress.

Turning now to those species which habitually reproduce themselves by consanguineous mating, we find very close consanguinity prevailing among certain species living in colonies—for instance, among certain ants, where the male and female of each pair always belong to the same colony. We find hermaphroditism chiefly in species which have lost their power of movement, and which are rooted to one spot, as in the case of oysters, barnacles, various corals, etc. Hermaphroditism is found also in all the species of terrestrial snails, and both self-fertilisation and cross-fertilisation may occur, according to circumstances, among certain species, such as the Cirripedes.

That the mode of reproduction, as the most important factor in the life of the species, is always adapted to circumstances is

shown plainly by the remarkable cases of hermaphroditism and self-fertilisation. The species whose constitution admits of self-fertilisation have this faculty as an adaptation to the particular conditions of their life. Species such as the Cirripedes, oysters, etc., which are incapable of moving about and going in search of a sexually differentiated partner, have an obvious advantage if they possess the faculty of self-fertilisation, for in this case solitary individuals for which amphimixis would be impossible need not be lost as reproductive members of the species on that account. Hermaphroditism, apart from self-fertilisation, is also advantageous, for did sexual differentiation exist in such sedentary species, there would be a great risk that two individuals thus differentiated would never come across one another, and thus fertilisation would be impossible. It is, therefore, evident why only hermaphrodite individuals have survived.

In the Cirripedes we find some species not only adapted for self-fertilisation, but at the same time capable of sexual union. The same holds good of certain parasitic worms, which, according as they live alone or in companies within the bladder or intestine of their host, fertilise themselves or exhibit sexual union. In the Cirripedes a male is produced every year, which has the appearance of a rudimentary organism, but is none the less capable of fertilising. Later on, the females fertilise themselves, and a second generation is the product of self-fertilisation. But as every year brings a generation of males, amphimixis alternates with self-fertilisation. Some other crustacea—for instance, the parasitic *Amibæra*—are what is called “protandrous hermaphrodites”; that is to say, they are males in their youth, and become females with the advance of age.

Darwin noted that, “although various terrestrial species are hermaphrodites, such as the land mollusca and certain earth-worms, all these pair. As yet I have not found a single terrestrial animal which can fertilise itself. This remarkable fact, which offers so strong a contrast with terrestrial plants, is intelligible

on the view of an occasional cross being indispensable.”¹ Subsequent searches have shown, however, that parasitic worms, when they exist *alone* in the body of a host, are capable of self-fertilisation, and this faculty may be interpreted as a theoretical as well as a practical necessity in regard to the persistence of the species. But this occasional self-fertilisation does not exclude the possibility of crossing, and these parasites are also capable of the latter mode of reproduction.

With regard to the “indispensable” nature of crossing, on which Darwin has insisted, the remarkable cases of heterogony, or regular succession of parthenogenesis and sexual reproduction, observed in the Daphnids seem to prove once more that amphimixis is not so much an indispensable condition of the continuance of life as an adaptation, exceedingly effective in certain circumstances, which secures the stability and progression of the species. The conditions of life of the Daphnids are favourable only for a short period, while during a much longer period they are distinctly unfavourable. The habitats of these crustaceans—ditches, ponds, bogs—are frequently frozen in winter and dried up in summer, and the conservation of the species can only be effected by the production of eggs capable of withstanding frost or drought. These eggs are always female, and their product invariably reproduces by parthenogenesis, so that a large number of offspring can be rapidly produced when the conditions permit. During the period in which the conditions are favourable—that is to say, in which the habitat is open—a generation of males is produced, and the thick-shelled winter or summer eggs are the result of the previous fertilisation of the females. Thus we have a clear illustration of the fact that the mode of reproduction is adapted to the conditions of life. If the individuals arising from the winter or summer eggs had first of all to seek a sexually differentiated partner before reproducing themselves, it is obvious that the chances of the survival of the

¹ Darwin, *The Origin of Species*, p. 123.

species would be practically *nil*, owing to the uncertainty in the vital conditions.

It is evident that in one of their results consanguinity and self-fertilisation must be analogous ; both modes of reproduction will result in making the germ-plasm monotonous. As we have already said, sexual reproduction has fewer risks for the species than consanguinity, and the same holds good of self-fertilisation.

In parthenogenesis the second maturation division does not occur ; consequently, the number of heterogeneous ids will not be reduced, and may remain constant during long periods ; although fresh elements are not introduced, those heterogeneous elements already possessed when the sexual method of reproduction was abandoned by the species will not be ousted by an increasing invasion of homogeneous elements. If a parthenogenetic species is eliminated, this will be due, not to the spread of constitutional defects, but because the individuals are not sufficiently plastic to readapt themselves, or because, in the case of species which have been adapted for a long time, a readaptation is too slow in coming.

Turning now to the results of consanguineous unions in the species which interests us most in our present study, we come to the results of consanguinity in human society. Reliable statistics are difficult to obtain, but it may be said that, as a general rule, no judgment can be pronounced for or against consanguinity as such. Everything depends upon the condition of the individuals who practise it. Historically, *exogamy*, "as at first established, implies an extremely abject condition of women, a brutal treatment of them, and an entire absence of the higher sentiments that accompany the relations of the sexes. Associated with the lowest type of political life, it is also associated with the lowest type of domestic life." And, on the other hand, "*endogamy*, which at the outset must have characterised the more peaceful groups, and which has prevailed as societies have become less hostile, is

a concomitant of the higher forms of the family.”¹ The eventual prohibition of incest and other forms of near consanguinity was due to the growth of religious ideas, and especially of totemistic beliefs, and not at all to physiological reasons, as M. Durkheim has shown.²

In China, the land of tradition *par excellence*, no man may marry a woman of the same family name—“a law which places a barrier against the progress of the harmful results of consanguinity. . . . One may judge of the effectiveness of this ordinance when one remembers that there exist only about 500 different family names in China. The extraordinary power of resistance possessed by the Chinese race is probably due in part to this institution.”³ Dr. Schallmayer adds that, on the other hand, intermarriage with foreign peoples is also prohibited among the Chinese; an ordinance which likewise prevents racial degeneracy—at least, as far as women of a biologically inferior race are concerned.

The genealogy of the family of a Dr. Bourgeois, reported by M. Delage, shows that this family originated in 1729 from a consanguineous marriage. After 130 years of existence, out of 91 marriages which had taken place, 68 were consanguineous, and of these 16 were marriages of accumulated consanguinity. In the 23 non-consanguineous marriages the mortality of children under seven years of age was 15 per cent., while it was only 12 per cent. among the children of the 68 consanguineous unions. The only defects observed among 416 individuals were two cases of epilepsy, one case of imbecility, one of accidental mental alienation, two cases of consumption, and one case of scrofula, derived from a non-consanguineous parent. Thus we have a total of five organic forms of disease, one accidental form, and one

¹ Spencer, *Principles of Sociology*, i. 629.

² E. Durkheim, *La Prohibition de l'Inceste et ses Origines*, in *L'Année Sociologique*, tome i. Paris, Alcan, 1898.

³ W. Schallmayer, *Vererbung und Auslese im Lebenslauf der Völker*, pp. 198, 199. Jena, 1903.

form derived from exogamic heredity. Not one of these defects resulted from six marriages which were consanguineous in the fourth degree. Here is clear evidence that consanguinity is not intrinsically harmful. In the same way, Delage reports the observations of Voisin on the community of the island of Batz, on the French coast, in which consanguinity is the rule ; this community is remarkable for the vigour and beauty of its inhabitants, and defects due to consanguinity are unknown.¹

Dr. Charles Féré, the eminent psychiatrist of Bicêtre, remarks emphatically that " la consanguinité, qui a été accusée de pouvoir déterminer à elle seule des névropathies, et particulièrement la surdi-mutité, n'agit en réalité que par l'accumulation de l'hérédité. . . . La consanguinité n'agit qu'en favorisant l'hérédité des qualités familiales bonnes ou mauvaises ; dans les familles saines elle est à rechercher, dans les familles morbides elle est à éviter."² Where morbid predispositions already exist consanguinity is harmful ; for instance, as Dr. Féré remarks further on (p. 50), epilepsy and infantile eclampsy can be developed by the morbid consanguinity of neuropathic parents ; and the neurasthenia which is so general a characteristic of the Jewish race is probably due to morbid conditions acting in conjunction with the consanguinity practised for so long by the Jews.³

Numerous biological examples could be cited in support of the fact that consanguinity is not intrinsically harmful. According to Samson, quoted by Delage, one of the finest herds of the Durham race of cows has its origin in the union of a bull with its mother or sisters, and with five or six generations of daughters and grand-daughters. Among the small herds of Brittany and Auvergne a single bull serves all the female members of the herd,

¹ Delage, *op. cit.*, p. 269.

² Ch. Féré, *La Famille Névropathique : théorie tératologique de l'hérédité et de la prédisposition morbides, et de la dégénérescence*, pp. 15, 16. Paris, Alcan, 1898.

³ J. Béraud, *Essai sur la Pathologie des Sémites* (Thèse de Doctorat, Bordeaux, 1897). Cited by Féré, *op. cit.*

which are thus, all of them, his sisters, daughters, or aunts; and yet the race shows no signs of degeneracy. And in the self-fertilisation which occurs among various species of crustaceans, etc., already mentioned—self-fertilisation often obligatory in the interest of the preservation of the species—it does not appear that any sort of degeneracy has been noticed in the species which are adapted to this method of reproduction.

To sum up, we may say that consanguinity is not in itself a necessary cause of biological degeneracy. Where an unfavourable variation, through some cause or other, already exists, consanguinity tends to favour its dissemination and increase, and in so far consanguinity is a frequent cause of degeneracy; but where no morbid variation already exists, and in the case of old and well-adapted species, consanguinity may be practised without any disadvantageous results. Indeed, as consanguinity accumulates homogeneous ids in the germ-plasm, families which are thoroughly healthy in all their members may practise consanguinity with advantage, as every fresh intermarriage will result in an accumulation of favourable determinant complexes—i.e., of healthy elements.

CHAPTER VIII

HYBRIDISM AND INTERCROSSING

OPINIONS as to the social value of intercrossing were much divided during the first part of the latter half of the nineteenth century. On the one hand, Quatrefages believed, not only in the harmlessness, but in the positive benefits, of social hybridism. In defence of his thesis, he cited instances culled from the most varied countries—the South Sea Islands, Mexico, Brazil, Paraguay, Argentina, Chile ; and he declared that, notably in South America, “a population approaching ever nearer to the white type will end by absorbing all the other elements.” Quatrefages also cited the case of the Pitcairn Island mutineers, afterwards removed to Norfolk Island. When Captain Beechey visited Pitcairn in 1825, he found there a population of seventy individuals remarkable for their strength, agility, and alert intelligence, not less than for their moral qualities and for their desire to instruct themselves. And yet this population was entirely hybrid, derived as it was from English sailors, Taitians, and Polynesian women.¹

On the other hand, Gobineau saw in such crossing the source of racial degeneracy. “It would be erroneous,” he wrote, “to pretend that all intercrossing is necessarily harmful. . . . The offspring may be reared. Unfortunately, however, the older generation has at the same time been degraded, and this is an evil which nothing can compensate or make good. . . . There-

¹ Quatrefages, cited by Ribot, *L'Hérédité psychologique*, p. 345. Paris, Alcan, 1902.

fore, though crossing may, within certain limits, be favourable to the mass of humanity, which it elevates and dignifies, that advantage is obtained at the expense of this same humanity, since intercrossing, on the other hand, abases it, humiliates it, degrades it, robs it of its noblest elements ; and even were one to admit that it is better to raise a myriad of insignificant creatures to the height of mediocrity rather than to preserve the princely races whose blood, diluted, impoverished, poisoned, is the means of effecting this shameful metamorphosis, there still remains the ominous fact that intercrossing, once begun, never ceases. The mediocrities which were yesterday formed at the expense of all that was great unite to-day with greater mediocrities ; and from these intermarriages, becoming ever more degraded, arises a confusion which, like that of Babel, results in the direst impotence, and leads society to hopeless and irremediable bankruptcy.”¹

It may be said of hybridism, as of consanguinity, that it is not in itself necessarily harmful ; but hybridism presents, as a general rule, dangers greater than those of consanguinity. For consanguinity, practised in a family whose members are all sound and healthy, cannot but lead to the most favourable results ; the difficulty is to find many families fulfilling this condition. Hybridism, on the other hand, has never been known to result in fertility persisting for more than four or five generations ; and in the majority of cases hybridism results in complete sterility.

If we turn to the vast domain of biology, which alone can give secure information on this subject, we find several curious phenomena associated with hybridism and crossing beyond the limits of the species. In the first place, hybridism does not always have sterility as a consequence, although it generally does, and although it always seems to reduce the fertility of the

¹ J. A. de Gobineau, *Essai sur l'Inégalité des Races Humaines*, livre i., chap. xvi. 2nd edition, Paris, 1876. *Vide* also R. Dreyfus, *La Vie et les Prophéties du Comte de Gobineau*, p. 65. Paris, Calmann-Lévy, 1905.

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It may be said of hybridism, as of consanguinity, that it is not in itself necessarily harmful ; but hybridism presents, as a general rule, dangers greater than those of consanguinity. For consanguinity, practised in a family whose members are all sound and healthy, cannot but lead to the most favourable results ; the difficulty is to find many families fulfilling this condition. Hybridism, on the other hand, has never been known to result in fertility persisting for more than four or five generations ; and in the majority of cases hybridism results in complete sterility.

If we turn to the vast domain of biology, which alone can give secure information on this subject, we find several curious phenomena associated with hybridism and crossing beyond the limits of the species. In the first place, hybridism does not always have sterility as a consequence, although it generally does, and although it always seems to reduce the fertility of the

¹ J. A. de Gobineau, *Essai sur l'Inégalité des Races Humaines*, livre i., chap. xvi. 2nd edition, Paris, 1876. *Vide* also R. Dreyfus, *La Vie et les Prophéties du Comte de Gobineau*, p. 65. Paris, Calmann-Lévy, 1905.

hybrids ; in the second place, there is no relation between the difficulty of crossing species and their fertility, or between the structural resemblance of species and their aptitude for crossing ; in the third place, what is perhaps most remarkable, is that the male of a certain species A may fertilise the female of a species B, whereas the male of B is unable to fertilise the female of A. In a word, the fertility of what Darwin has called first crosses between different species of the same genus, or even between species belonging to different genera, is intrinsically variable, and depends largely on the constitution of the individuals who happen to make the experiment. A distinction must, however, be made between the first cross of two individuals, each of which belongs to a pure species, and the subsequent crossing of their hybrid products.

We have said that hybrids are not invariably sterile. Darwin, who championed this view against the eminent botanists Kolreuter and Gärtner, attributed the sterility of hybrid plants in many cases to too close interbreeding. "I have made so many experiments and collected so many facts," he writes, "showing, on the one hand, that an occasional cross with a distinct individual or variety increases the vigour and fertility of the offspring, and, on the other hand, that very close interbreeding lessens their vigour and fertility, that I cannot doubt the correctness of this conclusion."¹ This view of Darwin's is a logical corollary of the theory which attributes to consanguinity a tendency to *accumulate* inheritance, to bring together into one germ-plasm an ever-increasing number of homogeneous ids. If, as we have said, a pathological predisposition already exists in a family, consanguineous intermarriage spreads the determinants of this predisposition among the whole family, and accumulates them until sterility is the result. As hybridism involves, as far as the reproductive organs are concerned, an undoubtedly pathological and abnormal condition, the interbreeding of individuals in this

¹ *The Origin of Species*, p. 369.

condition must necessarily lead to rapid and complete degeneracy.

Darwin, nevertheless, quite admits that hybridism, as a general rule, results in sterility, and that the further apart two species are, the more difficult their crossing becomes, until at last crossing between species belonging to two distinct families is an impossibility. It is true that a hybrid has once been obtained from a cross between *Asterias* (a starfish) and *Arbacia* (a sea-urchin), which belong to widely separated families, but the offspring which resulted did not survive the larval stage.¹ This is the only occasion in which a cross between two distinct families has been obtained.

Darwin remarks that "with our domesticated animals the various races, when crossed together, are quite fertile; yet in many cases they are descended from two or more wild species. From this fact we must conclude, either that the aboriginal parent species at first produced perfectly fertile hybrids, or that the hybrids subsequently reared under domestication became quite fertile. This latter alternative seems by far the most probable, and can, indeed, hardly be doubted. It is, for instance, certain that our dogs are descended from several wild stocks; yet, with perhaps the exception of certain indigenous domestic dogs of South America, all are quite fertile together."² It is certain that domestication tends to counterbalance the difficulty of crossing which different species exhibit in the state of nature; for instance, two wild species in the state of nature will not cross, or, if they do cross, they will produce either no progeny or sterile progeny; whereas the lineal descendants of either ancestor, after a prolonged period of domestication, may exhibit a high degree of fertility.

The degree of fertility, both of first crosses and of hybrids, may vary from zero to perfect fertility. "When pollen from a

¹ Delage, *L'Hérédité*, etc., p. 272.

² *The Origin of Species*, p. 374.

plant of one family is placed on the stigma of a plant of a distinct family, it exerts no more influence than so much inorganic dust. From this absolute zero of fertility, the pollen of different species applied to the stigma of some one species of the same genus yields a perfect gradation in the number of seeds produced up to nearly complete, or even quite complete, fertility ; and, as we have seen, in certain abnormal cases, even to an excess of fertility beyond that which the plant's own pollen produces. So in hybrids themselves there are some which never have produced, and probably never would produce, even with the pollen of the pure parents, a single fertile seed. From this extreme degree of sterility, we have self-fertilised hybrids producing a greater and greater number of seeds up to perfect fertility.¹

Thus, it cannot be maintained that hybridism *necessarily* entails sterility. But it is none the less certain that, as a general rule, sterility does accompany hybridism, if not in the first, then in subsequent generations. Crossing between distinct species may be said to entail degeneracy and sterility as a general rule ; this rule, like all others, has its exceptions, as we have shown, but these comparatively rare exceptions do not affect the validity of the general rule.

And this degeneracy of hybrids is not surprising when we consider that they are the product of the unnatural crossing of two distinct species ; consequently, they are not in natural conditions : there is a lack of harmony between them and their environment. Their entire organisation has been disturbed by the mingling of two distinct structures and constitutions, including the reproductive systems. The only cause for surprise is, not that ultimate sterility is the result of so incompatible a mixture, but that immediate and unconditional sterility does not result.

As to the cause which directly renders either first crosses or their products sterile, it may either lie in the physical impossibility of the male element reaching the female element, or of the

¹ *The Origin of Species*, p. 376.

inability of the male element, even if it reaches the ovum, to fertilise the latter; or, again, in the early destruction of the embryo, if an embryo is formed. Such an early death of the embryo is a very frequent cause of sterility in first crosses; and this is not surprising when we remember that a hybrid has, as it were, only half of the nature and constitution of its mother, and that it may therefore, before birth, "as long as it is nourished within its mother's womb or within the egg or seed produced by the mother, be exposed to conditions in some degree unsuitable, and consequently be liable to perish at an early period, more especially as all very young beings are eminently sensitive to injurious or unnatural conditions of life." But, after all, as Darwin remarks, "the cause more probably lies in some imperfection in the original act of impregnation, causing the embryo to be imperfectly developed, rather than in the conditions to which it is subsequently exposed."¹

It must nevertheless be remarked that there is a great difference, as regards consequences, between the crossing of two distinct species and the crossing of two varieties of the same species. We have already mentioned that domestication, in the case of species long adapted to it, tends to eliminate sterility in hybrids; and, consequently, the external conditions of a species long domesticated may be changed very considerably without the reproductive power of the species being thereby affected. On the other hand, wild species, when taken from their natural conditions of life and placed under domestication, will not breed, the most conspicuous example of this being the elephant. There is much analogy between the sterility arising from hybridism and the sterility arising from a radical change in the environment of a wild animal, such as is effected when an animal is suddenly placed under domestication. In either case, it is the reproductive organs which are affected and rendered impotent. We have seen that such a result is, in the case of hybrids, not in the least

¹ *The Origin of Species*, pp. 388, 389.

surprising; it is likewise entirely comprehensible that species which, like those living in a state of nature, are adapted to conditions of considerable stability, should, if the conditions are suddenly altered, be adversely affected in their most fundamental faculty.

Domesticated species—that is to say, those which have been for a long time adapted to domestication—are not exposed to that uniformity and stability of conditions which obtain in the case of wild species; and this difference in the nature of environing conditions explains why changes of environment which prove fatal to the reproductive power of the one are without influence on the other. But it also explains why the reproductive organs of the stabler species should be more sensitive to a change in the conditions of reproduction, even as they are more sensitive to a change in the conditions of the vegetative life. “Domestic productions, on the one hand, which, as shown by the mere fact of their domestication, were not originally highly sensitive to changes in their conditions of life, and which can now generally resist with undiminished fertility repeated changes of conditions, might be expected to produce varieties which would be little liable to have their reproductive powers injuriously affected by the act of crossing with other varieties which had originated in a like manner.”¹

Let us consider the result of crossing two species as compared with the result of crossing two varieties, independently of the question of fertility. It may be said that the crossing of varieties which are not too widely separated is almost always distinctly beneficial, enhancing as it does the vigour and energy and reproductive power of the descendants—provided, of course, that neither parent is affected by a microbic disease or the like, which would be transmitted to the offspring. It may even be that a

¹ *The Origin of Species*, p. 401. It must be remarked that all varieties are not fertile when crossed, although most of them are. Darwin cites a few examples of non-fertility resulting from the crossing of varieties—e.g., of two varieties of maize.

pathological predisposition in one parent is eliminated, as far as the offspring are concerned, by the mingling of slightly different, and healthy, blood. As to the product of two distinct species and of hybrids, opinion is divided. It must, however, be borne in mind that just as results based on the facts of self-fertilisation do not warrant us judging of the probable results of consanguinity; so the results of the crossing of varieties are by no means analogous to those obtained by the crossing of species or hybrids. On the one hand there is the clearest evidence, as Darwin puts it, that a cross between individuals of the same species, which differ to a certain extent, gives vigour and fertility to the offspring; and on the other hand the balance of evidence decidedly tends to show that a cross between individuals of different species, or even of very distinct varieties of the same species, is by no means beneficial as a general rule.

Darwin remarks that every traveller has noticed the degeneration and also the savage character of hybrid human races. He quotes Livingstone, who observed that no one could understand why the half-breeds in the Zambesi country are much more cruel than the Portuguese, but the fact is incontestable. An inhabitant, indeed, once summed up the case epigrammatically when he said to Livingstone that "God had made the white man, and God had made the black, but the devil had made the half-breed." Darwin goes on to quote Humboldt, who likewise expresses himself in vigorous terms concerning the savage disposition of the half-breeds of Indians and negroes; and Darwin observes that when two races, *both of which are inferior*, cross, the product is in the highest degree unsatisfactory.¹ Whether or not this degradation is the result of a return to atavistic forms, such as we witness occasionally in biology, it is certain that racial intercrossing usually brings indubitable racial degeneracy in its train. "The instability of half-breeds, like their dissimilarity, usually increases from generation to generation, until

¹ *Variations of Animals and Plants under Domestication*, ii. 48, 49.

the race becomes extinct.”¹ The only argument which even M. Bouglé, in a book evidently written with a most unscientific *parti pris*, is able to adduce in favour of hybrid populations is that in Brazil nearly all the painters and musicians, and a considerable number of doctors, are half-breeds; and that in Venezuela a number of mulattoes have been distinguished as orators or poets.² Without pausing to consider whether attaining distinction as a musician or orator in Brazil is in itself a particularly high claim to intellectual or artistic pre-eminence, we may remark that this argument does not invalidate the fact of physical and moral degeneracy which is a consequence of social hybridism.

¹ G. de Lapouge, *Les Sélections sociales*, p. 169. Paris, Fontemoing, 1896.

² C. Bouglé, *La Démocratie devant la Science*, p. 80. Paris, Alcan, 1904.

CHAPTER IX

THE ORIGIN AND EXTINCTION OF SPECIES

ONE of the most important problems involved in the complicated mechanism of evolution is that of the rise and progress of species. Passing over the question of spontaneous generation and the origin of organic life, we have to ask, How are species formed ? We considered this question briefly in the first chapter, where we noted that different species are evolved from a common ancestor ; that transformations of type are effected in the first place by *variation* ; in the second place by *selection*, which causes the best variation under given conditions to survive ; in the third place by *heredity*, which consolidates the result obtained by selection by fixing and maintaining it. Variation, selection, and heredity are the three great factors in the evolution of species, the three great laws of organic life.

Researches which have been made in regard to the evolution of the land-snails of the Celebes, notably the studies of Sarasin, afford a good example of what we may term *spatial*, as distinct from *temporal*, evolution. These researches show that, since the later Tertiary period, a remarkable evolution of these land-snails has taken place. A number of new species have been evolved, and their evolution has proceeded *pari passu* with the retreat of the sea, and with the consequent growth of the island. The present species form, in their totality, a chain in which the different species are all connected by intermediary links, and the result is that if we consider them in their order of progression from the first to the last, we find before us, not the well-differen-

tiated forms which we usually associate with the idea of species, but a series of gradual variations merging one into another. But if we take the parent species and compare it with the most distant species, we find at once that there is an enormous difference, which justifies our regarding them as distinct species.

The interpretation of this long chain of gradually increasing differentiations is to be found in the fact that a primitive Tertiary species has spread gradually through the whole length and breadth of the island, differentiating itself from the original type in proportion to the distance between a new habitat and the original head-quarters. We have here before us the different stages of a progressive phyletic evolution, not in time alone, but also in space; the successive stages of that evolution coexist in space before us. It is as if we had Darwin's diagram before our eyes, and could trace the successive steps of evolution.¹

We have studied several problems of evolution and heredity, and our general conclusion has been that selection is not only the main, but the exclusive, factor in bringing about evolution. Selection, as we have seen, begins already among the primordial living elements, among the biophors and determinants of the germ-plasm; so that even those characters which possess only a morphological, as distinct from a biological, value are likewise the result of a selection exercised among these primitive elements of the germ. We have examined a few cases which have been especially urged in support of the Lamarckian hypothesis, and we found that they do not really prove any transmission of the results of use or disuse, nor the postulated reaction of the soma on the germinal material. In regard to hereditary instincts, we saw that selection preserved those modes of activity which are indispensable to the life of the species. We saw, again, that amphimixis, as also asexual reproduction, is due alike in its origin and development to selection; for every mode of reproduction is an *adaptation*, and is consequently the work of selec-

¹ *The Origin of Species*, p. 140.

tion. Selection, again, intervenes in consanguinity, rooting out those families whose consanguinity has been the cause of their degeneracy, preserving those whose consanguinity has been beneficial. In the same way, we may say that there is selection of first crosses and of hybrids. And now we come to see that in the origin and evolution of species in general selection is the preponderating—nay, the sole—factor; for species may be defined in every case as complexes of adaptation.

A.—SPECIES AS DETERMINED BY SELECTION.

The idea of a “phyletic force,” which was suggested by Nägeli, is based on the supposition that every species is, as it were, a living crystal, determined in its evolution by internal forces, each step in a given direction necessarily producing the next step. For Nägeli the *rôle* of natural selection in the evolution of species was practically reduced to zero; for Nägeli would not admit that the modifications of a species are due to adaptation, or that they were anything but the result of the action of intra-germinal forces. Accordingly, once this view of evolution is accepted, there is nothing to prevent our drawing the conclusion which Nägeli drew—which, indeed, is the only logical conclusion—namely, that the environment is without influence on the evolution of species, and that their constitution at any given moment would remain identical under entirely different conditions. It is a “phyletic force” which guides the evolution of the organic world, and which produces those transformations which result in the differentiation of well-defined species. It should be noted that Nägeli thought of this phyletic force in a purely scientific and mechanical way, not by any means in a mystical one. Nevertheless, the theory of Nägeli requires to be completed and explained by that of Darwin.

Were the theory of Nägeli sufficient, it would be easy to understand how it is that we find everywhere the aggregates which we

call species—that is to say, a number of individuals resembling one another in all important features, differing from one another only in unimportant variations, but marked off by a constant difference in some important features from the individuals composing other species ; and how it is that we do not find, instead of these well-defined species, a number of loosely defined variations. For species, according to Nägeli, are the result of the action of a phyletic force moving always in a given direction, no matter what may be the external conditions.

But while there is an element of truth in Nägeli's theory, it cannot stand by itself. No phyletic force, scientifically conceived, acting by means of purely intragerminal variations, is sufficient to explain the evolution of the organic world as we know it. But it is none the less true that the *origin* of every variation in the organic world is found to be within the germ-plasm ; and that every variation is initiated by a perturbation of the equilibrium of the germ-plasm, a perturbation caused by oscillations in the regulation of intragerminal nutrition. Thus, Darwin's theory of natural selection as the sole cause of organic evolution is supplemented by Nägeli's conception of the internal origin of variations.

Support has recently been lent to the doctrine of Nägeli by the mutations theory of De Vries.¹ In his study of various cultivated plants—e.g., *Oenothera Lamarckiana*—De Vries found that a number of strongly marked variations suddenly manifested themselves in a number of individuals, and that these variations bred true—that is to say, the variants, when fertilised by their own pollen, brought forth the same variation in identical form. All the Linnæan species, according to De Vries, are composed of a number of elementary species—such as the sudden and spontaneous variation of *Oenothera* represents—and these elementary species, in their turn, are the result, as is proved by the case of *Oenothera*, of “mutation,” of a sudden

¹ Hugo De Vries, *Die Mutationstheorie*. Leipzig, 1901.

and spontaneous variation arising among a number of individuals of the same species at a given moment, and breaking up the parent species into several differentiated daughter species. The difference between such mutations and ordinary variations, according to De Vries, is that the former alone are hereditary. Mutations may occur in any direction : some are useful, some are harmful ; natural selection secures the survival of those that are useful, and the elimination of those that are not. Thus, according to De Vries, natural selection, although stripped of any positive and " formative " value, has a negative value, inasmuch as it eliminates the useless mutations. On the other hand, De Vries agrees with Nägeli in referring the initiation of new species wholly and solely to intragerminal action, which manifests itself periodically in the emergence of mutations. For selection, as we have said, does not, according to De Vries, have any share in *forming* mutations, but only in eliminating those that are disadvantageous.

Although the view of De Vries, that mutations play an important rôle in the origin of new species, is undoubtedly correct, it is probable that such mutations are much more frequent in the plant world than in the animal world ; and De Vries, whose great talent all must admire, has perhaps built too broad a generalisation on his botanical basis.

This is not the place to enter into the details of the theory ; we only wished to point out how the mutation theory of De Vries lends support to the doctrine of an internal phyletic force advanced by Nägeli.

Against the view which sees in species nothing but a complex of adaptations, it has been urged that numerous variations occur in parts which are only of secondary importance and possess no biological value. It may be remarked, in the first place, that biological value has often been denied to parts which may very possibly possess such a value, which in some cases, indeed, almost certainly possess it. Sarasin has maintained that the

modification of the shells of the Celebes land-snails cannot be due to natural selection ; but Weismann has pointed out that the shell is adapted to cover the viscera of the animal ; and that, as we know neither the kind of food peculiar to the different species of snails, nor the varying nutritive value of these different kinds of food, nor the changes in secretion, assimilation, and excretion consequent on these differences of nutritive value, it is impossible to state precisely in what way the digestive apparatus of each species is adapted to its mode of life, nor to appreciate the value of the differences that obtain, nor to establish even an approximate correlation between the digestive apparatus of each snail and its food.¹ But recent researches have shown that changes of nourishment may, as a matter of fact, produce various modifications of the digestive tract, and consequently of the shell which covers it ; and the latter, in adapting itself to the snail's conditions of life, comes within the scope of natural selection.

We have said that the origin of every variation is to be found within the germ-plasm. It is through perturbations of intragerminal equilibrium that variations arise, and thus these intragerminal variations constitute the material on which natural selection, in Darwin's sense of the term, can operate. But numerous variations do not attain biological value, and are consequently beneath the reach of natural selection. Nevertheless, such variations may become indices of a species, manifesting themselves as "indifferent" characters, although it is not these characters which determine the *constitution* of a species. They may be compared with the moss in a forest, which latter is characterised by its trees ; the moss might be entirely extirpated without affecting the character of the forest. The "organisation of the organism," the harmony of its different parts, the correlated variations which ensue from a change in many given parts, are due, not to natural selection as Darwin

¹ Weismann, *Vorträge über Deszendenztheorie*, ii. 253.

understood it, but, as he said, to the "laws of growth, and of the reciprocal influence of the different parts," or, as Wilhelm Roux termed it, to "histonal selection."¹ It is histonal selection which determines the mutual position of the parts, each part being determined, in its constitution, by the degree of specific attraction exercised by its component cells. And we must also remember that a correlation exists between germinal and natural selection. A variation which is originated by germinal selection, and, having attained biological value, is favoured by natural selection, may produce a correlated variation in another group of determinants; the determinate of the latter may in itself possess no appreciable biological value, and yet it will be maintained as long as the primary variation is maintained. For correlation exists, not only in the fully formed organism, but at every stage of the life-history, from the germ-cell until death.

Thus, secondary characters cannot determine the constitution of a species. They are due, it is true, to purely intragerminal action, but not as Nägeli understood it, nor as De Vries seems to understand it; for they, too, are a result of selection—germinal selection—both in their origin and in their disposition in the fully formed organism. All biologically important characters, however, are the result of *natural selection completing the work of germinal selection*, and acting on those variations which the latter presents to it. The difference between Darwin and Weismann lies in this, that for Weismann the element of pure chance is considerably reduced; each time an adaptation to new conditions becomes necessary in the interests of the species, that variation will be presented by germinal selection, and natural selection has simply to act on it. When we consider that there are only two possible modes of variation in the germ—progressive and regressive—it is evident that the chances are 100 to 1 that one or other of these will set in; and as the number of individuals in a species is

¹ *Vide* pp. 35, 36.

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¹ Vide pp. 35, 36.

sufficiently great, it follows that a large number of *different* variations, either towards plus or towards minus, must set in. Those variations which are favourable, which serve to adapt the individuals possessing them to the changed conditions of life, will be favoured by natural selection, and the others rejected; that is to say, the individuals which possess them will not survive. Thus, practically every time a new adaptation is necessary, natural selection has the requisite material to choose from.

On the one hand, therefore, the theory of Nägeli is justified, in so far as every organic variation has its origin in the germ-plasm, and is due to germinal selection; and, on the other hand, Nägeli's theory must be completed by that of Darwin, for characters which are of biological importance to the species must be selected according to the law of the survival of the fittest. Germinal selection by itself is capable of explaining only the secondary variations; natural selection alone is too dependent on chance for the adaptation of the species to be left solely to it. The evolution of a species is best interpreted as a combination of, or a co-operation between, germinal and natural selection. And thus the seemingly contradictory doctrines of Nägeli and Darwin are reconciled.

B.—INFLUENCE OF THE ENVIRONMENT ON SPECIES.

We have seen that secondary variations may be brought out, either in the species as a whole or in certain individuals of a species, which do not attain biological value. The maintenance of such secondary variations depends, in great part, on the chances of amphimixis; for should the determinants of a secondary variation *a* in an individual A be able to combine with the homologous determinants of an identical variation in an individual B, the variation will be preserved; and its maintenance will continue as long as the chances of amphimixis are favourable to it. If the secondary variation thus produced be in correlative

dependence on a primary variation which is a biological characteristic of the species as a whole, the secondary variation will likewise become a characteristic of the species, though only a secondary and morphological one.

But there are cases of a variation being produced among all the individuals of a species, and thus becoming a characteristic of the whole species, though it is not of biological value in the struggle for existence. As a rule, however, as we have said, a secondary variation is restricted to a limited number of individuals, and is eventually suppressed as a result of amphimixis—as we see often in the case of abnormalities and monstrosities. And this is readily intelligible when we remember that perturbations of the intragerminal nutrition, which are the source of such variations, may affect, in the germ-plasm of one individual, the determinant A, in that of another the determinant B, and so forth; and when we recollect, further, that *a majority of identical determinants in a majority of ids must vary in the same direction* in the germ-plasm of *every* member of the species, before a variation can become a characteristic of that species.

Thus, if a biologically indifferent variation is to become a characteristic of a species, there must be some condition which acts in an identical manner on every individual of the species. Obviously such a condition can only be found in the environment in which the whole species lives, and to which the whole species is exposed. The action of the environment can therefore produce such variations, which are not, strictly speaking, adaptations, for they are not of biological importance. The most important of these environmental conditions are climate and food.

Two questions at once present themselves for consideration: in the first place, to what extent are such environmental conditions capable of affecting the soma of the individual? It is evident that diet influences somatic development—that certain foods tend to fatten, certain others to reduce the size of the body. Experiments made on dogs belonging to the same litter, some

of which were nourished abundantly, while others were more or less starved, have amply demonstrated this fact. In the second place, we have to inquire how far modifications effected by outside influences are capable of being transmitted by heredity. If such modifications are non-transmissible, the influence of the modifying conditions can only make itself felt as long as these conditions actually prevail. Each newly born individual is affected in an identical manner ; but if these modifications are not transmitted, they cannot become a permanent characteristic of the species, although, owing to their uniformity, they may present such an appearance as long as they last.

The question of the transmission of modifications acquired under the influence of environmental conditions has been sometimes raised in order to try to justify the Lamarckian theory of the transmission of acquired somatic characters. In reality, as we shall see, the question can be reduced to two aspects, neither of which affords any justification of the Lamarckian hypothesis. Either modifications acquired under the influence of environmental conditions are hereditary—and in this case there is nothing in the least surprising about the fact, for it is extremely likely that the reproductive cells will be affected by profound changes in the temperature or in the nutrition ; or else such modifications are not hereditary—and this is certainly true in a large number of cases.

The last case may be illustrated by the galls which are developed on plants. The gall is wholly useless to the plant, and therefore there can be no question of adaptation, of any receptivity on the plant's part to the insect which produces the gall. The latter is developed solely by the direct action of the larva, which exerts a stimulus on the surrounding cells of the plant strong enough to affect considerable modifications. What the precise nature of this stimulus is we are not able to state with certainty ; it is, however, very probable that the movements and salivary secretions of the larva effect certain changes

in the constitution of the surrounding cells. Now, although certain trees—oak-trees especially—are every year regularly visited by great numbers of gall insects, the gall itself is never inherited; a fact which shows that considerable modification may be effected by the direct action of environmental conditions in each individual life, and yet remain purely somatic and without in any way affecting the germ-cells.

The experiments of Nägeli on different species and varieties of *Hieracium* (Hawkweed) teach the same lesson. For thirteen years he cultivated 2,500 varieties of these Alpine plants in the botanical gardens of Munich, and observed in every case that the characteristic modifications due to the change of habitat which were effected during the first year reappeared afresh in each successive generation. Experiments showed that they were not inherited, but simply acquired anew. It is thus evident that these changes, due to climatic influence, considerably modified the soma of all the individuals placed under the same conditions, but did not affect the reproductive cells. The experiment of Nägeli is valuable and interesting in showing that profound modifications may affect the soma, yet not affect the germ-cells; and here again a great breach—if another breach be needed—is made in the Lamarckian theory. Nevertheless, Nägeli's experiment is not to be held as conclusively demonstrating that modifications due to environing conditions are never in any circumstances transmissible. Detner has shown that the cherry-tree of European climes, when transported to Ceylon, becomes transformed into a tree having persistent foliage, and that this transformation is hereditary. As we have said, profound changes in temperature or in the nutrition of the organism are, *a priori*, very likely to affect the reproductive cells, although it is probable that not all, but only certain specific determinants of the germ-plasm are thus modified.

The experiments of Weismann on *Polyommatus Phlæas*, a butterfly of the family of *Lycenidæ*, show that temperature

undoubtedly exerts a strong influence on the pupa. At a temperature of $+10^{\circ}\text{C.}$, he was able to produce the northern variety from the pupa developed from the egg of an individual of the southern variety ; and at a temperature of $+38^{\circ}\text{C.}$, the contrary result was obtained, the southern variety being produced from the pupa of a northern egg. The subsequent experiments of Standfuss and Merrifield have shown that, by lowering the temperature to -8°C. , it is possible to obtain aberrations from the normal type in the case of species of *Vanessa* ; and these aberrations represented more or less a return to an ancestral type, as was proved by a comparative study of the colouring of the wings in the different *Vanessa* species. It may be said that this sudden transformation of the *Vanessa* under the influence of low temperature is similar to the mutations observed by De Vries in plants under cultivation. But a distinction may be drawn between the two cases ; in the one case a single brusque change of temperature suffices to modify the colouring of the wings, whereas in the other case the mutation is preceded by a more or less prolonged period of premutation, during which the readaptation of the reproductive parts is proceeding, becoming at length suddenly manifest in the mutation. There is, nevertheless, an analogy in so far as mutations are also the result of the action of environing conditions.

The aberrations brought about by the lowered temperature are explicable on the supposition that the determinants of the wings are, in the pupa stage, subjected to different degrees of influence, with the result that some determinant species are strengthened, others weakened ; so that the colouring on the developed wings is unequally developed as compared with the normal type, the sphere of colouring being in one part above the normal, in another part below the normal, in a third part entirely suppressed. By this alteration of the balance of the colour determinants a return to an ancestral type is obtained ; thus, we must conclude that in the germ-plasm of the modern *Vanessa* species a number

of ancestral ids are still retained, side by side with the determinants of the modern type.¹

These aberrations, caused by the influence of temperature, are in a certain degree hereditary. The experiments of Fischer on *Ardia Caja*, a species of butterfly with markedly vivid colouring, have shown that a lowering of the temperature to -8° C. during the pupa stage will produce a dark variety, and that this variety will be reproduced by the next generation, although in a much lesser degree. This fact shows that the germ-plasm has been, indeed, affected by the influence of the temperature along with the soma, but not so strongly. The phenomenon is curious, for it looks, at first sight, as if we had to deal with an inherited somatic modification, whereas this is not the case.

To sum up, we may say that, in the majority of cases, it is very doubtful whether changes determined by climatic or nutritive influences are hereditary; the case of Nägeli's *Hieracium*, and of the galls produced on plants, show how great may be the modifications effected in the soma, which, notwithstanding, fail to affect the germ-plasm. Nevertheless, that such environmental influences are capable occasionally of acting directly on the germ-plasm is shown by the case of *Vanessa*. And we may state, as a scientific possibility, that climatic and other environmental influences may alter the germ of a species, so far as such alteration is compatible with the continued existence of that species. That is to say, if that species is physiologically incapable of adapting itself to environmental modification, then that species must succumb. Selection is incapable of adapting any species beyond certain limits of climatic or nutritive change; for there are temperatures above or below which all life is impossible—at least, in the form in which we know

¹ *Vide* p. 79 with reference to the biogenetic law. We may note that not all the determinants of the germ-plasm are modified as the result of the lowering of the temperature, but only the determinants of the colouring of the wings. This supplies another argument against the theory of a homogeneous germ-plasm.

it ; and the question whether, were life differently constituted, it would be feasible for selection to adapt other forms of life to other conditions is an idle one.

C.—INFLUENCE OF ISOLATION.

Isolation necessarily plays an important *rôle* in the evolution of species. Darwin laid particular stress on the influence which species sharing the same habitat exert on one another. Thus, the vegetation of Paraguay would be considerably different from what it is at present if cattle or horses existed there in a feral state ; but the absence of cattle and horses is due to the prevalence of a certain fly which lays its egg in the navels of these animals when first born. The number of these flies depends on that of other insects, and they, in turn, depend upon the existence of certain insectivorous birds. In the same way, in England, humble-bees are the only bees which visit red clover, as other bees cannot reach the nectar. But the number of humble-bees in any district depends, in great measure, upon the number of field-mice ; and the number of field-mice is dependent on the number of cats ; so that, eventually, the amount of red clover in a district is intricately bound up with the number of cats in that district.¹ These well-known examples which Darwin gives of the mutual influence exerted by species having the same habitat suffice to give an illustration of what we mean.

An acquaintance with these phenomena prepares us to expect their corollary, that any change in the flora or fauna of a given district must necessarily react on all the other species inhabiting that district, probably causing them to vary in a greater or lesser degree. In the same way, when the habitat of a species is changed, when it finds itself transported into new conditions, a variation will set in ; for the species will have to undergo

¹ *The Origin of Species*, pp. 89, 90.

readaptation to its changed environment. The variation will be readily persistent in proportion as the species in its new surroundings remains isolated from the species whose habitat it formerly shared. And likewise, if a single individual of a species be transported into a new environment, any variation which may set in will have a greater chance of becoming permanent, and of evolving into a new and well-defined species, if this individual and its descendants are isolated from the parent species.

It may be stated, as a general law of evolution, that the development and differentiation of species is promoted by isolation. Suppose the normally fertilised female of a butterfly to be transported by a bird from the mainland to an island on which no single member of the species existed. The fact that this butterfly could multiply without crossing with individuals of the parent species on the mainland would not in itself be any reason for the evolution of a new variety. But supposing this butterfly to differ, in any insignificant feature of colouring, from the parent species—as might, indeed, easily arise from germinal selection—the very fact of its isolation from the parent species will almost certainly ensure the preservation of this variation; for, supposing the latter to exist in a majority of ids in the germ-plasm of the parent butterfly, it will be transmitted to a majority of ids in the germ-plasm of the next generation; and, as there is no risk of amphimixis with individuals not possessing the variation the latter is very likely to be maintained, and to become eventually, through amphimixis, a characteristic of the species. The reduction of the ids at maturation is a risk, but if the variation exists in a large majority of ids, this risk is considerably lessened; and in proportion as the variation obtains in an ever greater number of individuals, the maturation reduction loses its importance. Variations which develop into characteristics of a species solely through isolation may be termed “variations effected through amixis.”

It is still more propitious to the evolution of species if an isolated territory be large enough to afford sustenance, not only for the originally transported species, but for others nearly related. In this case, the original species can adapt itself to a number of different environmental conditions, and a number of new species, not merely of new varieties, can be formed. This has been the case with those land-snails of the island of Celebes which we have already mentioned; as the original emigrant multiplied its descendants, these distributed themselves more and more over the island, and were compelled to adapt themselves to an ever-increasing number of new conditions; with the result that a number of new species were formed, differing among themselves, however, only in comparatively trivial features, such as we are accustomed to find among the varieties of the same species. We have, in the case of the Celebes snails, a good example of the co-operation of isolation and natural selection, the latter selecting those individuals most adaptable to the new environment. Darwin has expressed the view that "if an isolated area be very small, either from being surrounded by barriers, or from having very peculiar physical conditions, the total number of the inhabitants will be small; and this will retard the production of new species through natural selection, by decreasing the chances of favourable variation arising." And, further, that "although small isolated areas have been in some respects highly favourable for the production of new species, yet the course of modification will generally have been more rapid on large areas; and what is more important, the new forms produced on large areas, which have already been victorious over many competitors, will be those that will spread most widely, and will give rise to the greatest number of new varieties and species."¹

Thus, isolation must be regarded as an important factor in the transformation of species. Its action will be all the more

¹ *The Origin of Species*, pp. 128 ff.

beneficial when the isolated area is large enough to support a number of species, and when the original species can differentiate itself into several new species, according to the differences in climatic and other conditions obtaining in the area. An isolated area, if it be too small, inhibits further differentiation; but a larger area, capable of affording sustenance to a number of species, will be doubly advantageous: firstly, because isolation from the parent species permits of greater development of variations; and, secondly, because the mutual influence exerted by the isolated species, and the greater necessity for rigorous adaptation, will involve a keener competition, and, consequently, a stronger set of survivors.¹

¹ Darwin has shown that many animals and plants which we might at first think could not be transported from one country to another over the sea are, nevertheless, so transported. We can understand birds and butterflies and bats being blown by the wind across vast tracts of sea, but we could not have predicted that seeds could be transported in the intestine of a bird, or that minute animals could be carried across the ocean in a small mass of earth or mud adhering to the bird's foot; such is the case, however. There is no doubt but that such passive migrations have played an important part in the origin of species.

Not only an island, but also a lofty mountain or plateau, may form an isolated area. Isolation in an absolute sense cannot be imagined, for there is probably no spot entirely inaccessible under any conditions to any species. And if we find species existing in any area, it is always possible that others may likewise arrive. Nevertheless, isolation may be complete during the whole period which our observation is capable of embracing. We must also take into account the climatic and geological conditions and the possible changes which may occur, such as the sinking of the land and its washing away by the sea, and *vice versa*, the sudden elevation of new land as a result of volcanic disturbances, etc. It is possible that several endemic species of snails which are found on the Sandwich Islands and Galapagos Islands were there previously to the sinking of the land which formerly joined these islands with the mainland.

The Sandwich Islands, which are some 3,000 miles from the American coast, have a very interesting snail fauna, consisting of not less than 400 endemic species; and Weismann is of opinion that these endemic species owe their origin to accidental importation by birds from the continent. These islands possess also eighteen endemic species of birds. The Galapagos Islands, which lie some 750 miles from the mainland, possess twenty-one endemic species of birds. The island of Madeira possesses 109 endemic species of snails, but only one single endemic species

D.—THE EXTINCTION OF SPECIES.

We have seen that a species is a *complex of adaptations*, and that species result, in every case, from adaptation to the environment. It is not those general variations which De Vries has called mutations that are the cause of the origin of new species; for such mutations, as De Vries has shown, are in themselves neither good nor bad. Their preservation cannot, therefore, be due to natural selection; for the latter can only act in cases of adaptation when two variations present themselves, one of which is more advantageous to the species in the given conditions. If mutation were the origin of those organic distinctions which we call species, natural selection would be reduced to the negative rôle of eliminating those variations which were useless or harmful. The possibilities of transformation would obviously be greatly reduced if mutation were the sole cause; and it is difficult to see what cause could act on the different members

of bird. This rarity is due to the fact that Madeira is less than 200 miles distant from the African coast, and that, as many mainland birds are blown over to the island every year, crossing between the island birds and those from the mainland has been frequent, with the result that new variations have always been kept in check by amphimixis.

Amixis, or the prevention, through isolation, of crossing with the parent species, does not, however, *necessarily* lead to variation. In Sardinia we find two varieties of the species *Vanessa urtica*, one of which is endemic and has varied distinctly from the parent species, while the other has not varied. It has been suggested that the two stocks were not isolated at the same time, but we can find no justification for this supposition and its corollary, that the variation manifested by the endemic stock is due to the direct action of the climate. There are some butterflies which occur both in the Alps and in the Polar regions. Some of these have varied, so that we can distinguish an Alpine from a Polar variety, but others have remained the same in the two regions; and yet we know that all of them were isolated at the same time. The explanation is that at the time of geographical separation during the Glacial period one of the species was in a period of variation, whereas the other was in a period of constancy. Isolation has prevented the variations from being "swamped," while it has had no effect on the other species, which remain to-day as they were in the Glacial period before their separation from the parent species. No

of any species with sufficient uniformity and regularity to produce the numerous varieties which we see in the organic world to-day, unless it be the environing conditions. But it is evident that, although food and climate play a rôle in the production of new varieties, they could not possibly have effected all those minute changes in the structure and function of organisms, which are undoubtedly adaptations to the vital conditions. When we consider, for instance, the case of the whale, or of the different bird species, or of the luminous organs of deep-sea fishes—to mention only a few—it is difficult to see how so far-sighted a biologist as Delage can reject the theory of individual variation as the primary cause of the evolution of species ; and go so far as to declare, with Lamarck, that food, climate, use, and disuse, are the sole causes of such evolution.

variation had set in at the time of separation, and, no condition having since arisen capable of determining a variation, amixis alone has been insufficient to effect one.

That isolation or amixis has been a potent factor in the origin of new species is sufficiently shown by the figures quoted in this note, for all endemic species are, as their name indicates, due to isolation. Romanes has used the term "isolation" in a more general sense, to include all the various ways in which the range of intercrossing is narrowed among variants. Prominent among these is what we may term "sexual" isolation, or the physiological hindrance to intercrossing among such variants. It is evident that in the struggle for existence favourable variants are selected at the expense of the original non-varying forms ; that the latter, becoming ever less and less numerous, are eventually suppressed ; and that the favourable variants, unless they were "isolated" from the parent stock, could never become permanent. This organic progress is impossible without some form of isolation. The whole efficacy of natural selection depends on a certain degree of "isolation." But this more general "isolation," as indicated by Romanes, is not to be confused with spatial isolation on a separate area ; and it is in this sense that Darwin and Weismann use the term.

The fewer species there are in possession of an island, the greater are the chances of variation in an emigrant ; for the more space and food there is, the better is it able to multiply. The more the descendants multiply, the more they distribute themselves over the virgin territory, and the more likelihood there is of numerous variations setting in, and of numerous species being originated. This is probably the reason of the great number of endemic species of snails on the Sandwich Islands.

In the phenomenon of the origin of species, more, perhaps, than in any other, we see the action of selection.¹

The life-history of species is sometimes compared to that of organisms. Species, it has been said, undergo, like organisms,

¹ The case of the luminous organs of deep-sea fishes is particularly instructive. In some instances we find glands which secrete a luminous substance; in others we have before us a complicated organ, resembling a lantern, from which a ray of light is projected like a flash from a light-house. This apparatus possesses a highly developed innervation, and its origin can certainly not be due to mutation—that is to say, to the accidental sudden emergence of discontinuous variations in a number of individuals without relation to the conditions of external life. As little can we attribute its origin to climatic influence, for not every species of fish possesses this luminous apparatus, but only some deep-sea species; and yet the climatic conditions must act in a manner which is not very dissimilar on all the inhabitants of the different zones of the ocean. At all events, these conditions are not sufficiently heterogeneous to account for the heterogeneity of luminous organs among different species. The transmission of the effects of use and disuse is, as we have seen, highly improbable, and—at any rate, in the present instance—it can find no application. These complicated “lanterns” are found in very different species of deep-sea fish, and their utility as an aid in catching prey is probable; for Chun has pointed out that they serve to attract the smaller fish, just as the electric lamp attracts insects. But not all the different species have the luminous organs on the head or jaws. Some have them on the flank, others on the ventral surface; and Weismann has pointed out how very probable it is that these organs on the flank or ventral surface serve to illuminate the floor of the ocean, and to render prey visible in the darkness. The theory of Delage and De Vries is incapable of showing why these luminous organs should have arisen in the deep-sea fishes and not in those species whose habitat is nearer the surface; whereas their origin becomes easily explicable if we see in such organs a case of adaptation to peculiar circumstances, to the obscurity of the ocean depths. Those individuals which exhibit a variation in the direction of luminosity must have been selected, and thus the evolution of the peculiarity would advance until it was completely adapted.

The deep-sea fishes afford another instance of adaptation in their eyes, which are often unusually large. Every organ is equally the result of adaptation, as is also the entire nervous system. The whale among marine animals is one of the most striking examples of adaptation. It belongs to the class of mammals, but its body has wholly changed its shape, having become similar to that of a fish. The hind-legs have disappeared entirely, being represented only by vestiges within the muscular system; the fore-legs have been transformed into flippers, but the usual skeletal parts are all present. The hairy covering of the ancestors has now

the ordeal of birth, growth, decline, and extinction. If it can be said of species that they have no power of transcending a certain limit of life, death must be for them, as for multicellular organisms, a constitutional necessity.

The death of multicellular organisms, after a certain age-limit is reached, is a consequence of evolution itself. Unicellular organisms do not succumb, as the multicellular organisms do, to the natural wear and tear of life; having reached a certain stage of growth, the unicellular organism divides into two—each

so completely disappeared that it is sometimes only discoverable as a vestige in the embryo. All these transformations are adaptations to the aquatic life, and have been called forth by the changed conditions of life of the species.

Delage, in his criticisms of the theory of selection (*L'Hérédité*, etc., pp. 844 ff.), has based his arguments on a misunderstanding. He says that, in order that selection may favour the increase or decrease of any part of the organism, it is essential that this increase or decrease should be advantageous to the individual. This is incontestably true; but Delage proceeds to ask, following Herbert Spencer, what advantage the whale has gained from the progressive atrophy of its femur. The question seems to have been answered by Weismann. We have seen in our study of germinal selection that, although the continued existence of a part which has been rendered useless owing to a change in the conditions of life may not be in itself harmful to the species; nevertheless, the determinants of this useless part will continue to attract a stream of intragerminal nutrition which would otherwise go to sustain the determinants of useful parts; and this must necessarily entail a weakening of the determinants of these useful parts. Therefore, once a part has ceased to be of use, selection necessarily intervenes by withdrawing the intragerminal nutriment from the determinants of this useless part. We must also remember that selection is not only exercised between individuals or between the organs and parts of the same individual, but that it operates within the germ-plasm itself.

When Delage goes on to say that "une variation faible ne peut constituer un grand avantage," he is making an assertion which it is impossible to prove, for we have no means of judging in many cases of the biological value of a variation. It may often happen that a variation which is apparently insignificant is, nevertheless, of biological value; and, in any case, even those minor variations which do not attain biological value are none the less determined by germinal selection. Delage has only considered natural selection. The most insignificant variation is, however, none the less due to selection within the germ-plasm.

of the daughter cells reproduces all the qualities of the parent organism, and each in turn goes through the process of division. Unicellular organisms multiply in regular progression—1, 2, 4, 8, 16, 32, and so forth—but each organism is in itself immortal; that is to say, it does not succumb to the wear and tear of life, but simply divides into two when it reaches a certain limit of growth. There is no *death* of the organism in the physiological sense of the word—except that form of death which is due to external and accidental causes; in fact, for the Protozoa death is not a constitutional necessity, and every Protist is potentially immortal. Death is a physiological phenomenon which is not by any means intrinsically bound up with organic life as such, but is introduced at a later stage of evolution, as a consequence of that evolution. It is a result of the division of labour.¹

For it must be remembered that, in the case of the Metazoa, it is the soma alone which is subject to the physiological necessity of death; the germ-plasm is immortal. The somatic cells of the organism are mortal; they die, and must necessarily die, for their preservation would be of no use whatever to the species in the struggle for existence. In the case of these complicated organisms it would be impossible for reproduction to be effected by fission; and it would be equally impossible to effect the integral transmission of the parent organism to each of the progeny. The growth and complication of the organism, the ever-increasing division of labour among the parts, require that a distinct substance be set apart for the reproduction of the species. We have seen that this substance is the chromatin substance in the nucleus of the germ-cells; and this germ substance is immortal. It transmits itself integrally from one generation to another, and this transmission is essential for the continuity of the species.

Thus we see that death is a direct consequence of differen-

¹ Weismann, *Vorträge über Deszendenztheorie*, i. 211-214; A. Dastre, *La Vie et la Mort*, pp. 325 ff. Paris, 1905.

tiation and evolution; that it is an adaptation of the higher multicellular organisms to the conditions of life itself, brought about, as it is, by the necessity for the integral transmission of an hereditary substance, and the impossibility of thus transmitting a developed organism. Immortality—and this word is to be understood in a merely biological sense—is the property of the lowest organisms, and of the germ-plasm of the higher organisms. The soma-plasm, however, is incapable of exceeding certain age-limits.

If we turn now from individual organisms to species, we do not find any parallel between the ontogenetic development of the one and the phylogenetic evolution of the other. This is not to be understood as a denial of the biogenetic law, the formulation of which by Fritz Müller and Haeckel was one of the most important events in the history of modern biology. But though the embryonic development of the individual recapitulates the history of the species, either in complete, though abbreviated, fashion (palingenesis), or in a more or less modified manner (cenogenesis), this does not imply that the subsequent course of the ontogeny should resemble the phylogeny of species in general. In other words, the phylogeny is not necessarily subjected to the laws of birth, growth, decline, and extinction, to which the ontogeny is subjected.

Whereas the death of the soma is a constitutional necessity for multicellular organisms, it does not appear that death is, in the strict sense of the word, a necessity for the species. The fact that the species is a complex of adaptations, that it has its origin in a variation which has been developed by natural selection, shows that the species is not immortal or eternal; and palæontology affords sufficient evidence of the fact that innumerable species have been annihilated in the course of ages. Indeed, not only species, but entire genera—nay, entire classes—have been rooted out; and it has therefore been concluded that every species must necessarily pass through the

cycle of evolution and dissolution which the individual organism exhibits.

Although it is incontestably true that every species must partake of the fate of the world *in toto*, and, along with this globe on which they live, one day vanish, as so many myriads of other worlds have done, in the boundless space and time in which the cosmos is plunged ; yet there seems no reason for affirming that a species *must* pass through a cycle of evolution and dissolution owing to some inherent necessity of the germ-plasm. It has, indeed, been affirmed that the intragerminal force which brings about the evolution of species brings about their dissolution also ; and, if we accept Nägeli's theory of the species as a resultant of internal forces only, there is nothing to prevent our supposing that the mysterious vital force does indeed cause the regression and death of species, as well as their birth. There is, however, no justification for postulating this force, nor, indeed, any "inherent vital principle" independent of selection ; such mystical principles lie outside the domain of science.

If species were indeed subject to a fatal law of evolution and dissolution, there is no reason why the extinction of some species should ensue so much sooner than that of others. Among the Cephalopoda, the Nautilus has certainly existed since the Silurian epoch ; on the other hand, we know that other species have had a far shorter existence. Neumayer has shown that palæontological evidence all goes to prove this great inequality in the longevity of species, an inequality which is far too marked to warrant the idea of a physiological death of species similar to the physiological death of individuals. At the same time, this great inequality gives us the clue to the real reason for the extinction of species—namely, inability to adapt themselves.

The case of the extinct order of Trilobites illustrates what we mean. The Trilobites seem to have been exterminated in the Silurian epoch, precisely at the time when the various

Nautili made their appearance. It is very probable that the extinction of the Trilobites stands in direct relation to the evolution of the Nautili. It may be said that the Trilobites succumbed because they were attacked by senile decay, that they were too old to resist the assaults of younger and more vigorous enemies. But, on the contrary, the extinction of the Trilobites is certainly due to their failure to adapt themselves to new and modified conditions. Greater swiftness, more rapid multiplication, and greater intelligence on the part of the Nautili, were responsible for the extinction of the Trilobites. The latter, long adapted to constant conditions, were unable to adapt themselves with sufficient rapidity to the suddenly modified environment; and this failure to adapt themselves was due, not to senile decay, but to the fact that, in old and constant species, the determinants of the species are in a majority in all the ids of the germ-plasm, which is consequently unable to change its constitution except very slowly and gradually. The environment, in a word, changed too rapidly for the determinants of the long-adapted germ-plasm to keep pace with it.

In a great many cases the extinction of species may undoubtedly be attributed to the fact that the necessary variations involved in readaptation do not come about quickly enough. In other cases such extinction may be due to simple and direct inferiority in the struggle for existence; and this is the case with all those species which formerly existed wild in Europe, the wolf, the bear, the lynx, etc., which have now been nearly completely exterminated by man. Or, again, in other cases it may be due to a change in the flora of a region—as, for instance, in St. Helena, where the destruction of the dense forests which used to cover the island brought in its train the extinction of the endemic species of that island. To such an extent has man persisted in the destruction of wild animals that European Governments have been compelled to take steps to secure a “close season” for the giraffe, the lion, and other wild animals

in Africa. And this destruction of species by man is but a particularly vivid illustration of what has been accomplished by the warfare of species against species throughout the ages, and of what is still going on every day before our eyes.

And it is not only non-human species which become the victims of elimination through human agency ; the lower races of mankind give way before the evolution of the superior races. " When civilised nations come into contact with barbarians the struggle is short, except where a deadly climate gives its aid to the native race. Of the causes which lead to the victory of civilised nations, some are plain and simple, others complex and obscure. We can see that the cultivation of the land will be fatal in many ways to savages, for they cannot, or will not, change their habits. New diseases and vices have in some cases proved highly destructive, and it appears that a new disease often causes much death, until those who are most susceptible to its destructive influence are gradually weeded out ; and so it may be with spirituous liquors, as well as with the unconquerably strong taste for them shown by so many savages. It further appears, mysterious as is the fact, that the first meeting of distinct and separated people generates disease."¹ The inferior human race, like the animal species, is eliminated, not because it is in itself physically decrepit and senile, but because it is relatively inferior to its competitors. The savage whose land is uncultivated is not biologically degenerate, but when his land is placed under cultivation he is unable to adapt himself to the new conditions of life ; and failure to adapt oneself involves extinction.

Weismann has said that when we speak of the " senile decay " of a species, or of its alleged inability to undergo any further evolution, we are indulging in wholly unscientific fictions.² Neither species nor races suffer senile decay. The extinction of

¹ Darwin, *The Descent of Man*, p. 283 (edition 1901).

² *Vorträge*, ii. 298.

CHAPTER X

PARENTS AND OFFSPRING

WE have seen that the hereditary substance—the germ-plasm—of every organism is composed of ids. We have also seen that the hereditary substance is transmitted intact from one generation to another, that it is continuous, not made afresh in the course of generations. The doctrine of the continuity of the germ-plasm must be accepted as one of the most important conclusions of biological research since Darwin's statement of the law of natural selection. Thus, the germ-plasm of every individual is composed of the ids of all his ancestors. This does not mean that the germ-plasm of a human being includes the ids of the *Amœba*; for the ids do not remain eternally immutable. In reality, no single id corresponds to the likeness of any one of our animal ancestors; for the character of those ancestors was determined, not by any single, but by *all*, or by the *majority*, of the ids of the germ-plasm of each. And in the course of generations many ids must have been eliminated as the result of the so-called "reducing divisions"; and in this elimination of ancestral ids, according to Weismann, we find the reason for the expulsion of the polar bodies from the egg, and for the successive divisions of the sperm-cell before it attains maturity. The share of the *Amœba* in the constitution of the germ-plasm of the human being must necessarily be infinitesimal; during the course of ages amphimixis and successive reductions have been perpetually "renewing" the germ-plasm of succeeding generations, so to speak, mingling new ids, effecting new combinations,

fixed to be capable of modification except after many generations; and in the meantime the enemy multiplies and gains more and more ground. This failure to readapt itself must, as we have said, have proved fatal to many a species. But other causes, such as direct physical inferiority, or a change of climatic conditions, of food, of the flora and fauna of a region, may also operate; or else many, or all, of these causes may combine. In some cases we may be able to point, almost with certainty, to the predominance of a particular cause; in other cases it is almost impossible to distinguish the exact part played by the various factors. But we may say with confidence that there is no reason for referring the extinction of species to any cause beyond the changes produced in the environing conditions, in climate, food, etc., and to the failure to effect with sufficient rapidity the changes necessary to readaptation. The extinction of species does not warrant a belief in the theory of a vital force any more than their origin does.¹

¹ The case in which a species is destroyed by being directly inferior to a new species (for instance, the extermination of the giraffe by man) may be included in the category of the changes produced in the environing conditions. The contact of the giraffe with man effects a fatal change in the giraffe's conditions of life.

The result of the reducing division, as far as its significance for the theory of descent is concerned, is to render the germ-cells of the individual of different hereditary value. If we take four chromosomes as the normal number for a species, and suppose two, A and B, to have been inherited by an individual from the mother, and two, C and D, from the father, it is evident that, through the reduction division, either the id combination A and B can be separated from C and D, or else A and C from B and D, or else A and D from B and C. Thus, six different id combinations can be realised in any one germ-cell; or, in other words, there may be six kinds of germ-cells, each possessing a different id combination. If we suppose this "neotaxis" of the germ-plasm to take place in both male and female germ-cells, we shall find that, after fertilisation, $6 \times 6 = 36$ heterogeneous individuals may be produced from the germ-plasm of the two parents. Obviously, the greater the number of chromosomes, the greater the possible number of combinations. If we take eight as the normal number of chromosomes we shall have seventy possible combinations, if we take sixteen we have 12,870. The possibility of new combinations is immense if we suppose amphimixis between two individuals of such a species, bringing together 70×70 , or $12,870 \times 12,870$ potentialities. The normal number of chromosomes in the human species is, as a matter of fact, sixteen, so that the latter figures are applicable in this case.

We see that the possibility of effecting new combinations by amphimixis is enormous; and the chief rôle of amphimixis is undoubtedly the preservation and multiplication of variations within a species. For only in so far as a species presents an immense number of variations can natural selection act. Natural selection requires for its action great numbers; and if a species is to be maintained by the constant adaptation of its members to enviroing conditions, that species must present a great number of individuals to be selected. If, therefore, the

neotaxis of the germ-plasm were less productive of heterogeneous combinations, the number of heterogeneous individuals composing a species would be reduced. And, for the purpose of natural selection, it is not the number of homogeneous, but the number of heterogeneous, individuals which counts. A species which contains a million individuals, each of which is homogeneous with all the rest, has merely the selective value of one single individual. We thus see the immense importance of the reducing divisions and of amphimixis in effecting variations. We are justified, indeed, in regarding these processes as the ultimate source of all organic variation.

Although the number of possible combinations resulting from amphimixis between two individuals is very large, nevertheless, when we remember that, in the case of the male partner especially, an enormous number of germ-cells are produced in a lifetime, it will appear probable that several of the progeny of the same pair of parents will be homogeneous. As heterogeneity is essential for natural selection to act upon in order to effect adaptation, it is not surprising to find, if we may speak figuratively, that Nature has taken further means to ensure the necessary amount of heterogeneity. Recent observation has shown that, in some cases, the male and female elements in the nucleus of the fertilised ovum remain distinct from each other right through the embryonic development until the germ-cells of the offspring appear. It may be that this distinctness is maintained all through the ontogeny. But if the male and female elements, instead of being blended in the primitive germ-cell, remain distinct from each other throughout the ontogeny, the total number of combinations realisable by the union of male and female chromosomes is not exhausted when amphimixis is effected; fresh combinations may present themselves at every successive reducing division, in the production of all the countless germ-cells during the life of the individual.

The child is the resultant of the determining forces of all the

ids of the germ-plasm. Among the different determinant complexes which proceed from the heterogeneous ids, the complex which will have the greatest chance of determining the nature of a germ-cell will be that represented by the greatest number of homodynamic determinants. Homodynamic determinants, whether inherited from one of the parents or from both of them, will always compound their respective forces, whereas the heterodynamic determinants can, at most, produce a diagonal result; as a matter of fact, it must often happen that they inhibit one another, and, by reason of their opposition, mutually neutralise their influence. When a small minority of homodynamic determinants is opposed to an overwhelming majority of heterodynamic ones, the former will necessarily be rendered powerless as far as their effect on the development is concerned; and if a group, or groups, of heterodynamic determinants should acquire renewed strength as a result of amphimixis, this small minority may be eliminated entirely from the germ-plasm. Nevertheless, homodynamic determinants are by their nature more likely to acquire an influence in the determining of the germ-plasm than heterodynamic ones; and a large minority of such homodynamic determinants may succeed in determining the nature of the germ-cell when the majority of determinants are heterodynamic, and mutually inhibit one another.

As a rule, neither the father nor the mother has a preponderating hereditary influence. Nevertheless, offspring do not represent an average, or a "middle line," between their parents; for, if this were the case, all the children of a pair would be similar. As a matter of fact, the child, in one case, resembles its father, in another its mother, in a third case it resembles more or less closely one of its forefathers, and occasionally it is what is called a monstrosity—that is to say, it departs more or less completely from the morphological type of the species. The differences between the offspring of the same pair are due to the reduction phenomena which we have noticed, and

to the perpetual rearrangement or "neotaxis" of the germ-plasm.

As regards the crossing of old and stable species, it must be remembered that, whereas the determinants relating to the *individual* character may be different in every id of the germ-plasm, the determinants relating to the *specific* characters are identical in every id. Thus, when two individuals of such species cross, the homodynamic ids of the one meet the homodynamic ids of the other. It is obvious that, as all the ids are identical, the reduction of the plasm can produce no neotaxis, for every remingling will be a remingling of identical ids. The offspring of such first crosses must therefore be identical with one another as far as the specific determinants of the species are concerned; only secondary and individual differences can obtain among them.

In the crossing of individuals belonging to the same species, the specific determinants of the species play a secondary rôle. Differences in the individual characteristics do not exist merely between the two parental germ-plasms, but between the different ids of the germ-plasm; whereas in the case of species the characteristics of the two species are identical in all the ids. With regard to individual characters, the different combinations of ids, which are, as we have seen, the result of each successive reduction, can make up in every case a different sum of forces; so that either parent can produce germ-cells containing different organic arrangements, and, *inter alia*, either can produce in an active form arrangements which were latent in the parent, but which, owing to the chances of amphimixis and reduction, obtain a majority in the plasm of the offspring, and are therefore no longer latent.¹ Or else the ids of one parent containing a specific

¹ Latent characters are represented by a minority of determinants in the germ-plasm which are not strong enough to exert any influence on the development; but they form a reserve which, if the chances of amphimixis and reduction be favourable, may obtain a majority in the germ-plasm of the offspring, and thereby cause the latent character to manifest itself actively.

variation may be opposed by the homologous ids of the other parent containing another specific variation; and, in such a case, it may often happen that the biophors of the one parent are inferior in assimilating power to those of the other parent, so that the variation presented by the one parent will be entirely absent from the offspring.

The number of variations rendered possible by the neotaxis of the germ-plasm is, as we have seen, enormous. For instance, let us suppose the germ-plasm of the mother to consist of the homodynamic idant complex A^1 , and the germ-plasm of the father to be composed of a majority of the same idant complex A^1 , and likewise of a minority of ids containing variations A^2 and a^3 . The mother's hereditary substance A^1 will be counterbalanced by the hereditary substance A^1 of the father, and the mingling of the two substances as a result of amphimixis can only result in $A^1 + A^1$ —that is to say, in a summation of forces. But the paternal germ-plasm possess id complexes A^2 and a^3 , which are not counterbalanced by similar id complexes in the maternal germ-plasm; and, as the paternal germ-plasm is composed of $A^1 + A^2 + a^3$, whereas the maternal germ-plasm is limited to the variation A^1 , homodynamic with the paternal A^1 , the share of the father in determining the offspring will be preponderant. Of course, when we speak of the maternal germ-plasm as composed of a single variation A^1 , and the paternal germ-plasm as composed of the variations $A^1 + A^2 + a^3$, we are speaking of the germ-plasms as they are constituted *after the reduction*—in their “amphimixiated” condition, so to speak; and we do not mean to imply that any combination is really as simple as this, which we give only to illustrate how the preponderance of one parent can be brought about.

The maternal and the paternal germ-cells contain only one half of the maternal or paternal hereditary substance, the other half having been lost through the reduction process. The more or less numerous eggs produced by the mother during the life-

history do not contain the same id combinations, any more than do the innumerable sperm-cells produced by the male. The greater the number of chromosomes possessed by the species, the greater the number of possible combinations resulting from the perpetual rearrangement of the parental elements at each successive reduction division.¹

¹ A phenomenon which remains to be noticed is that of "return to the ancestral type," or atavism. This phenomenon is similar to that of the transmission of latent characters. Return to the ancestral type is almost always observable among young species. Among old and constant species it occurs very seldom, if at all. The explanation is that a young species may still possess a considerable minority of determinants of an older specific type in its germ-plasm; and the chances of reduction and amphimixis may bring about, even after numerous generations, a return to this type by the sudden "majorisation" of the minority of old determinants. In proportion as a species increases in age it also increases in stability, and returns to the ancestral type become less and less frequent. Such atavisms are aberrations which, being unsuited to the actual conditions of life of the species, do not propagate their kind. The experiments of breeders tend to show that six or eight generations, as a rule, are required to fix a new character definitely, and to prevent the accident of an atavistic return to the ancestral type. Atavism, it must be noted, may occur not only in the direct line of descent, but also in the collateral (*vide* Ribot, *L'Hérédité psychologique*, pp. 197 ff. Paris, 7th edition, 1905).

APPENDIX I

TERATOLOGICAL HEREDITY

THE peculiar mode of inheritance which is known as teratological may seem at first sight to contradict in certain respects the theory of the non-transmission of somatic modifications. We are not aware that the subject has been discussed, either in the works of Weismann or in those of his followers. It may be useful, therefore, to devote a little space to a consideration of the facts. Teratological inheritance involves the transmission of certain structural malformations, and may be treated under the heading of morphological pathology.

It would be a mistake, however, to suppose that these pathological malformations, which manifest themselves in the body of the organism, and are indubitably hereditary, are *exclusively somatic*.

It is safe to say that such malformations, which often present the appearance of an atavistic return to an ancestral type, are never to be found except on what the French call *un terrain morbide*. They are the somatic expressions of an organic disease which affects the germ-plasm as much as the soma.

Illustrations of the transmission of teratological malformations are numerous. We need only cite a few examples, as this is not a medical treatise. The symmetrical atrophy of the parietal bone of the cranium may be hereditary. The same may be said of anomalies in the development of the arteries, the pathogenic results of which are well known. The congenital narrowing of the pulmonary artery is a factor predisposing to pulmonary tuberculosis. Atresia of the aorta has a considerable influence on the pathology of the heart; chlorosis, that spontaneous anæmic condition which manifests itself at puberty, is sure to develop on ground which is well prepared by the abnormally small size of the heart. Aplasia of the arteries, insufficient development of the uterus and ovaries, and chlorosis, can be hereditary. Consumption is favoured by a number of malformations of the thorax; and all these abnormalities have the result of diminishing the respiratory capacity of the patient, of exaggerating the already insufficient activity of the upper part of the lung; they therefore predispose the patient to microbic infection. It is generally admitted that patients suffering from thoracic malformations are more exposed than others to bronchial pneumonia. The inheritance of appendicitis has been

recorded several times, and Féré inclines to the belief that this is due to the transmission of an abnormal anatomical peculiarity. The inheritance of arthritism is, according to some authorities, referable to a predisposition to proliferation on the part of the connective tissue, combined with greater irritability, which renders the tissue less capable of resisting. Gigantism may also be hereditary. Hypospadiasm, abnormalities of the testicle, absence of the uterus and ovaries, can all be transmitted. The same applies to obesity; and hæmophilia, which is accompanied by anomalies in the development of the heart, of the capillaries, and of the arteries, is essentially hereditary. Finally, so well-known a malformation as hare-lip is often transmitted.

We need not cite further instances. The medical world is practically unanimous as to the hereditary transmission of teratological malformations, and it is probable that familiarity with this transmission, coupled with inadequate acquaintance with the theory of Weismann, has led the medical profession to stand aloof from his theory of evolution; whereas the majority of non-medical biologists have adopted it. It is, perhaps, well to see whether Weismann's theory can be reconciled with the fact of the transmission of teratological characters; for a theory can only survive if it is in harmony with the facts; and it cannot be denied that the facts of teratological heredity do at first sight present a difficulty.

Dr. Charles Féré, of Bicêtre, has collected a store of facts relating to teratological heredity in general, and to the relations between teratological malformations and neuropathic diseases in particular.¹ Accepting the facts, which, he states, are based on a vast number of authorities, we would submit the following considerations.

It might be maintained that the general pathological condition of the germ-plasm of the parents, a condition which is determined by various causes, predisposes the offspring to teratological malformations. In this case the latter are not themselves inherited; what is inherited is the general pathological condition which serves as their constitutional basis. The teratological phenomena themselves are not hereditary, but congenital—that is to say, they are produced by some accident which occurred after the act of procreation, during the intra-uterine period. It is well to note the difference between the terms “hereditary” and “congenital.” Those characteristics alone are hereditary in the scientific sense of the word which are directly transmitted from the germ-plasm of the parents to the germ-plasm of the offspring; congenital characteristics are those which are acquired by the offspring during embryonic development, and which

¹ Ch. Féré, *La Famille névropathique : Théorie tératologique de l'hérédité et de la prédisposition morbides, et de la dégénérescence*, pp. 152–191 (Paris, Alcan, 1898). Vide also Isidore Geoffroy-Saint-Hilaire, *Histoire générale et particulière des Anomalies de l'Organisation*. 3 vols. Paris, 1833–37.

present, therefore—because they are acquired before birth—the *appearance* of being hereditary. Congenitally acquired characters, in so far as they affect the body only, cannot be hereditarily transmitted, any more than any other somatic characters.

If teratological characters are not hereditary, but only congenital, their explanation is simple enough—theoretically, at least. Von Baer showed that the embryos of all the vertebrates exhibit, at their origin, one common type; and that they go through a series of stages, identical in every species, before eventually differentiating themselves. Now, if, as is very widely held, teratological characters represent a reversion from the human type to some inferior animal type, the identity of form observable in the embryo of all the vertebrates in their earliest stages renders these characters comprehensible. As Féré remarks (pp. 212, 213), this common origin makes it probable that the embryo of every vertebrate contains *in potentia* the organs of all the others; and that, if the development of the embryo be accidentally disturbed by any cause, an organ belonging to one species may develop in the embryo of another species, or an organ which is constant in the species may disappear in an individual. "Quelques anomalies," continues Féré, "que nous retrouvons chez les types dégénérés de l'humanité, rappellent des formes appartenant à des êtres moins élevés que l'homme et même très éloignés de lui. Mais un trouble de l'embryogenèse peut produire les mêmes anomalies de l'organisation, la tératogenie expérimentale le montre surabondamment."

The question remains whether the teratological malformations are the cause which predisposes to the organic or functional disease; or whether they are themselves the morphological symptoms of an underlying constitutional degeneracy, which manifests itself at the same time in the disease which generally accompanies the malformation.

In the first place, it is certain that there is no causal relation implying a necessary correspondence between a given malformation and a given disease. It seems as if the same malformations may accompany several different diseases, and *vice versa*. In the second place, Féré accepts the view of John Hunter, that there is, in reality, no such thing as inheritance of diseases itself, but only inheritance of the morbid predisposition of which disease is the outcome. Féré admits that this view is correct, that "the facts, as a general rule, support it." If Hunter's theory be correct, it would seem as if—originally, at all events—it is the morbid constitution of the parent that is transmitted, and that this brings about a teratological manifestation in the offspring. Teratology would thus be the expression of a fundamental pathological disposition; the latter is the *conditio sine qua non* of the former.

Developing this idea, which is undoubtedly correct—that there is no teratological manifestation without an underlying morbid predisposition—it might be urged that what is hereditary is not the teratological mal-

formation itself, but only a pathological and weakened organic constitution; and that the teratological manifestation is the result of a congenital accident which occurs during the embryonic development. The development of the organs is not contemporaneous, but successive, and the localisation of the developmental aberrations of the organs varies according to the period at which the teratogenetic influences manifest themselves.

It may often happen that an accident to the amniotic membrane which envelops the embryo affects the entire organism. Thus it is undoubted that congenital influences play an important rôle as factors of teratogeny; and it is equally certain that such teratological accidents do not manifest themselves except in individuals predisposed to them by a pathological heredity. Consequently, Weismann's supporters might be tempted to affirm boldly that the weakness inherent in the organic constitution is the determining cause alike of the malformation and of the disease. An accident happening during the embryonic development acts simply as a secondary cause in the teratological formation; and an accident, whether during embryonic development or afterwards, acts simply as a secondary cause in inducing the disease. Thus, the malformation is a symptom of degeneracy in the constitution, just as is the disease; the malformation being the morphological manifestation of this constitutional defect, and the disease its organic manifestation. This view denies the inheritance, in the scientific sense of the word, of anything but the morbid predisposition; the teratological manifestations, as also the diseases, are due to congenital or (in the case of diseases) subsequent accidents. Teratological manifestations, therefore, are not in the strict sense hereditary phenomena.

Nevertheless, against those who maintain this view in order to escape from the difficulty of admitting the transmission of purely somatic characters, such as cranial abnormalities, etc., it may obviously be argued that teratological transmission has been conclusively demonstrated in so many cases that it is impossible to be content with explaining it as a mere congenital accident. The question necessarily presents itself in this case: If teratological malformations are hereditary, how comes it that the germ-plasm is able to transmit the morphological aberrations of bodily parts; since, as we have seen, the body has no means of communicating its characters to the germ? When, for instance, an arm or a leg is amputated, the result of this amputation is not transmitted, and we can readily explain the fact theoretically; for it is, on the face of it, impossible that the somatic cells should be able to communicate their altered arrangements to the germinal cells. There is no known mechanism by which the transmission could be effected. Or, if it be objected that the somatic cells could communicate their altered structural characters to the germ-cells by means of the nervous system—as has, indeed, been alleged in support of the now exploded theory of the hereditary transmission of epilepsy, based on Brown-Séquard's somewhat unsatisfactory experiments—it must

be acknowledged that the difficulty is not by any means overcome; for the nervous system can only communicate nervous waves, and not morphological characters. In order that a character may be hereditarily transmitted, it is essential that it should affect the germ-cells; it follows that only those influences can exercise any racial influence which are *general*—that is to say, which affect the reproductive cells along with the rest of the organism. The amputation of an arm affects the cells of the arm, but cannot possibly affect the reproductive cells; its influence is merely local, and not general.

But *are* teratological malformations merely local? We have said that such malformations can only manifest themselves on morbid ground, and such is undoubtedly the case. It may be regarded as proved that teratological characters are to be found only where a defective organisation already exists as an antecedent condition. This fact gives us a solution of the problem. Let us admit, to take an example, that a regressive and pathological variation has set in in a family as the result of a movement among the determinants of the germ-plasm. This variation need not necessarily affect the whole germ-plasm in an equal degree. It may affect more especially a particular group of determinants, the variation of which will result in some pathological feature, such as a cyst or a fistula. We may suppose, for instance, that the pathological determinants of the auditory meatus may attain, after a certain time, sufficient strength to be able to transmit themselves by heredity. There is nothing impossible, or even improbable, in this supposition.

To sum up our conclusions in definite formulæ, we would say:

1. The parental germ-plasm is in each case *infected*, either by a bacillus or by a pathological variation, which is equivalent in its results to a microbic infection.

2. This pathological variation, which affects the germ-plasm as a whole, affects in an especial degree a given group of determinants—a consequence of the perturbations of intragerminal nutrition.

3. It is not proved that the somatic manifestation of the malformation need be contemporaneous with the origin of the germinal infection. On the contrary, it is probable that the precise moment of the commencement of a pathological variation can never be ascertained; it is probable that the pathological variation of a group of determinants may continue to progress for two or three generations before manifesting itself externally.

4. Having gained, by means of intragerminal nutrition, a sufficient preponderance in the germ-plasm, this pathological variation of the group of determinants may manifest itself as the teratological malformation of the determinate corresponding to the group.

5. Degenerates very frequently intermarry, for it would seem as if they mutually attract one another. The teratological malformation, which is

never alone, but is always the expression of a pathological variation affecting the whole germ-plasm, may be transmitted, especially if its bearer unite with another individual whose germ-plasm is likewise in a state of pathological degeneracy.

6. The teratological malformation which accompanies a pathological condition of the germ is transmitted only for three or four generations; the family finally succumbs to sterility.

7. Those cases of dissimilar heredity, in which the malformation affects in the offspring a different organ from that which is affected in the parent, confirm the hypothesis that the teratological determinants simply form part of a general pathological variation. In the relations between the different groups of morbid determinants it is quite possible that now one pathological group, and now another, should gain sufficient strength to be able to manifest itself teratologically.

With regard to the action of alcoholism, which is often accompanied by teratological stigmata, it is possible that these stigmata are not always of a hereditary, but only of a congenital nature. Experimental teratology has demonstrated the great influence which even the smallest injection of alcohol may have on the egg, in causing profound nutritive troubles. As teratological characters resolve themselves into troubles of the nutritive system, we may suppose that the alcoholic mother exercises a similar influence on the embryo; and that she brings to the embryo a bad nutrition, which causes teratological malformations.

The fact that it is the constitutional condition of the organism which is the important point is again confirmed by the difference with which the same dose of poison may react on a healthy organism on the one hand, and on a more susceptible one on the other; producing no result in the one case, and determining in the other anatomical injuries. As a matter of fact, the part played by the neuropathic predisposition is recognised to-day in the case of a great many maladies, such as infantile paralysis, which were formerly regarded as independent nosological entities.

The question to-day is, as we have seen, Does there exist a disease which is a nosological entity? The rôle of morbid predisposition of a neuropathic nature in so many diseases formerly considered as independent, such as tuberculosis, syphilis, and even certain of the microbic infections, such as typhoid fever, is calculated to throw great doubt on the existence of discrete independent diseases. At all events, we may conclude that, as far as teratological heredity is concerned, there is nothing in the facts known to medical science incompatible with the theory of heredity and evolution as Weismann has expounded it.

APPENDIX II

LAMARCKISM AND THE RÉGIME OF CASTES

"THE activity of an organ, of a function, of a faculty," writes M. Topinard, one of the few remaining defenders of the Lamarckian theory of the heredity of somatic characters, "has the effect of developing them. Those variations which are most often exercised, and consequently elevated in degree, during the life of the individual, are also those which tend to repeat themselves in the progeny, and, if the same exercise be taken up again, to confirm themselves in the family. A labourer succeeds in raising a weight of so many kilogrammes, and, as a result of repeated experience, is finally able to raise three times the amount; his son, if he resemble the father, and if he take up the same kind of work, will succeed in raising a still greater weight, and will bequeath in turn to his son a predisposition to carry this muscular development still further. . . . It is the same with intellectual variations; these will attain a higher degree, with the help of appropriate heredity, in the families which exercise their brains than in those which depend upon their muscles."¹

It is obvious that this theory of heredity, if applied to sociology, must result in a complete justification of the régime of castes—that is to say, of the most anti-democratic régime conceivable. We do not say that the democratic régime is an ideal, or that it is in harmony with the laws governing organic development; but if it be, as we believe, in a large measure unscientific, nevertheless it is not the Lamarckian theory which can be employed in order to discredit it; for the Lamarckian theory no longer possesses any validity. We have raised the question as to the social aspects of Lamarckism because certain Socialist writers—notably Professor Ferri, in his work on *La Sociologie criminelle*—have taken upon themselves to defend this now exploded doctrine of the transmission of somatically acquired characters. These Social Democratic writers, in other words, are defending the very theory which, if true, must prove most ruinous to the whole democratic ideal; and which, if put into practice, must logically re-establish the régime of castes, the most anti-democratic ideal in existence, but not the less unscientific on that account.

If, as the Lamarckian hypothesis supposes, certain well-defined differentiations of individuals are formed by means of the continuous specialisation of their activities, we arrive at the doctrine that every man is born to his profession—that the son of a medical man is the best adapted for the

¹ P. Topinard, *L'Anthropologie et la Science Sociale*, p. 294. Paris, Masson, 1900.

medical profession, the son of the lawyer for the Bar, the son of the agricultural labourer for the plough. The consequences are obvious ; and it is curious to observe that it is precisely a Socialist writer who, unconsciously, has shown us what these consequences are. M. Hamon, in a well-known book, has written :

" Dans la nation, il existe des professions bien caractérisées, telles les professions militaire, de la magistrature, de la police, du clergé, etc. On conçoit aisément que, sous l'influence de l'exercice continu d'une profession, dans les encéphales prédisposés héréditairement, se détermine la production de caractères mentaux particuliers à ladite profession. Ces caractéristiques psychiques sont sans doute les effets d'une structure cérébrale particulière ; nous l'ignorons, vu l'état peu avancé de la science.

" Nous disons que les encéphales sont héréditairement prédisposés parce que le fait même d'adopter une profession plutôt qu'une autre, indique que l'exercice de cette profession plaît à celui qui l'adopte. Sa cérébration est telle qu'il trouve cette profession agréable ou moins désagréable qu'une autre. C'est l'opinion générale que pour la plupart des professions ceux qui les exercent eussent pu, par suite d'autres circonstances, ne point les exercer ; que, en un mot, la plupart des hommes n'ont point de congénitales prédispositions à l'adoption d'une carrière plutôt que d'une autre. Nous pensons que c'est là une conception erronée qui a son origine dans l'absence ou l'insuffisance d'analyse des cérébrations humaines."¹

Now, if the views expressed by M. Hamon were correct, we must logically arrive at the régime of castes. Nothing could, in this case, be more dangerous than to leave the choice of a profession invariably open to individual taste and judgment, seeing that the continued exercise of any profession must result in the formation of a well-differentiated cerebration peculiar to that profession—a differentiation which is increased by heredity in every successive generation. So that we obtain, finally, a set of well-differentiated individuals, possessing a cerebration expressly adapted to the career of the soldier ; another set similarly adapted to the duties of the magistrate ; another to the office of clerk ; another to the work of agricultural labourer ; and so forth. But what does this mean, if not that the régime of castes is re-established ? The régime of castes is founded precisely on the notion that a Brahman is born a Brahman, and that a techandala is born a techandala. If the dispositions which the agricultural labourer has acquired during his lifetime for the work which he pursues are inherited by the progeny of this agricultural labourer ; if these, in their turn, bequeath their disposition to the third generation, and so forth ; then we are justified in saying that the agricultural labourer has no right to endeavour to emancipate himself from the condition to which

¹ A. Hamon. *Psychologie de l'Anarchiste-Socialiste*. pp. 3, 4. Paris, Stock, 1895.

he is peculiarly adapted. On the Lamarckian hypothesis, which a Socialist writer like M. Hanson or Professor Ferri utilizes so sickly, we are justified in regarding as a crime any attempt on the part of manual workers to raise themselves to an intellectual profession; for the former are possessed of a cerebration which is peculiarly adapted to the manual labour they have to perform; and which is not at all adapted to the intellectual strain of the liberal professions. No hypothesis could possibly be more reactionary than the Lamarckian theory applied to sociology. It is not our purpose here to go into the question of the respective merits of democracy or the caste régime; but it is well to point out the inconsistency of democratic theorists who endeavour to justify their theories by means of a doctrine which, if it were applied to political science, must result in establishing the most anti-democratic system of society conceivable.

PART II
SOCIAL PATHOLOGY

1. The first part of the document is a list of names and titles, including "The Hon. Mr. Justice" and "The Hon. Mr. Justice".

CHAPTER I

SUICIDE AS A SOCIAL FACTOR

IN the first part of this work we have considered the facts relating to heredity and to selection, basing our inquiry on recent biological researches—especially on those of Weismann. We have seen that biological research tends more and more to insist upon the importance of selection as a factor in organic evolution. The fruitful conception of natural selection which we owe to Darwin has been further developed by Weismann; who, in his theory of germinal selection, has given reasons for believing that selection is already at work among the most elementary vital particles in the germ-plasm of each individual. But the laws of heredity and selection, as we have endeavoured to expound them, contain a still higher philosophy: they show us that everywhere a struggle for existence is in progress; and they show us, further, that any given organism can be maintained at a high stage of development only on condition that it be subjected to the full operation of the laws of selection. If an organism is, by some means or other, withdrawn from the struggle for existence, and, consequently, from the sphere of operation of the laws of selection, that organism will inevitably fall below the standard of development attained by it while subjected to the operation of these laws; it will sink back to an inferior level of evolution; and, as retrogression means annihilation under the existing conditions of life, this sinking back implies ultimate destruction.

That this must indeed be the case is evident if we bear in mind the conditions under which all organic evolution occurs. In the

first chapter of this book we saw that the four great factors which govern organic evolution are variability, heredity, excessive fertility, and the survival of the fittest by means of selection. Now, it is obvious that the survival of the fittest implies an excess of fertility ; for if there were sufficient space and food to enable all the organisms which are born to survive, there would be no struggle, consequently no question of fit or less fit individuals. As it is, however, if one hundred individuals are born where the available amount of space and food admits of the existence of not more than fifty, fifty individuals must be destroyed ; and the fifty who remain will remain because they are, physically or otherwise, superior to the fifty who have been eliminated. Even as it is with individuals of the same race, so it is with the different races of the same species or with distinct species. More are produced than can survive ; and only those who are superior in one way or other can survive. But this superiority, precisely, is engendered by the struggle for existence, and is maintained by it. Every variation which is useful to the species, which constitutes an advantage for the species, is selected, and becomes permanent ; and it will be preserved as long as its utility for the species lasts. That is to say, as long as the species remains in the same environment, subject to the same conditions, this variation will remain the same. For every such variation implies an adaptation of a species to its environment ; and every individual in the species in whom this variation is lacking will be destroyed *because* he is not adapted to his environment. Let us, however, withdraw the species from its natural surroundings and place it under artificial conditions of existence ; it may continue to exist, but it will do so only if it be artificially protected ; withdrawn from its natural surroundings, it will inevitably decay ; and its place will be taken by other species, more vigorous because bred in the only possible school—the school of Nature.

Thus we see that the tendency of organic life, when removed

from the natural conditions which alone are proper to it, is to fall back from the standard attained under the action of those conditions. It behoves us, therefore, applying the laws of selection to the human species, to see whether the conditions under which the evolution of that species in its highest forms is taking place are conditions which are favourable to the operation of these laws and to the action of natural conditions; or, in other words, to see whether Western civilisation is pursuing a course of evolution which tends to maintain the standard of efficiency indispensable to the nurture and production of the highest forms of our race.

When we come to the domain of man, the problem of selection confronts us under a different aspect to that under which it confronted us when treating of the life of the other species; or, rather, whereas selection among the other species does but aim—if we may be permitted to make figurative use of a teleological expression—at biological fitness, among the human species it tends likewise to *social* fitness. Social fitness does not mean intellectual fitness only; the emotional nature of man—and the arts which are its most profound expression—and also his moral sentiments, all go to compose the social constitution of humanity. The Red Indian was superior physically to the white man; but the social qualities of the white man enabled the latter to emerge victorious. In our Western civilisation to-day too little value is placed on the biological fitness of individual members of society; it is the progress of our institutions, the fruit of centuries of social evolution in the strict sense of the word, to which we attach importance and of which we are proud. In the following chapters we shall have occasion to deal with the question of the biological fitness of our Western civilisation. For the present, we will content ourselves with a glance at our much-vaunted social progress; and, in order to do this, we will take a concrete case in sociology—the question of the rate of suicide and of its increase.

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To those unaccustomed to the analysis of social problems the question will at once present itself whether, indeed, suicide is a problem for the sociologist at all. The view generally held in regard to suicide is that it is exclusively an individual phenomenon, dependent for its production on certain pathological nervous conditions; and we are far from denying the right of the neurologist to investigate the problem of suicide from the point of view of nervous disease. But it is also true that suicide can be considered from an entirely different standpoint; and that, in considering it, abstraction may be made of the individual predisposition, and the attention concentrated solely on the statistics of suicide as furnished by a given society at a given time. This social aspect of suicide considered *en masse*, and abstracted from the individual, has been hitherto very largely overlooked. Oettingen, Morselli, Legoyt, Masaryk, Westcott, Mayr, and, more recently, Durkheim, have dealt with the question; and it is from M. Emile Durkheim, the distinguished Professor of the University of Paris, that we have drawn most of our statistics on the subject.¹ Nevertheless, the view has, up till now, very generally prevailed that suicide is an exclusively individual phenomenon; and far more effort has been spent in endeavouring to trace each individual case of suicide to an individual predisposition than in endeavouring to discover the social causes of suicide considered *en masse*. In other words, suicide has been chiefly studied as a phenomenon of individual pathology; and not sufficient stress has been laid on it as a phenomenon of social pathology.

The reasons which have caused many sociologists to overlook this social aspect of suicide can all be traced to one source: the idea that the individual is the pivot of society, and that social evolution is but the evolution, at a higher degree, of the individuals who compose society; or, to express it otherwise, that, society being but a collection of individuals, the laws

¹ *Vide* E. Durkheim, *Le Suicide : Étude de Sociologie*. Paris, Alcan, 1897.

governing the evolution of individual life are also those which govern the evolution of social life. One of the most remarkable of these individualistic theories of social evolution is that of the late M. Tarde.¹ Tarde, as sociologists are aware, is the author of the theory which sees in imitation the fundamental characteristic of all social life. "It is incontestable," wrote Tarde, "that, once we enter upon life in society, we are but imitating others at every moment, in everything we do and in everything we think, unless, indeed, we introduce some innovation, which is seldom ; and even then it would be easy to prove that our innovations are, for the most part, combinations of previous patterns, and that they remain foreign to social life so long as they are not imitated. You do not say a word which is not the reproduction, unconscious now, but formerly conscious, of verbal articulations which are traceable to the most remote past, and which you reproduce with an accent proper to your surroundings ; you do not perform a single rite of your religion, whether you make the sign of the cross, or kiss an eikon, or repeat a prayer, which does not reproduce traditional gestures and formulæ—which, in other words, has not been formed by imitation of your ancestors ; you do not execute a single command, whether military or civil, you do not perform a single act relating to your profession which has not been taught you, and which you have not copied from some living model ; you do not give a stroke of the brush if you are a painter, you do not write a line if you are a poet, without conforming to the style or to the prosody of your school ; and your very originality is made up of accumulated commonplaces, and will become a commonplace in its turn." ²

This theory of Tarde's obviously implies that social evolution is determined by the action of a few predominant personalities whose influence is echoed through all strata of society ; social evolution is thus but the infinite series of repetitions of acts

¹ *Vide*, notably, his work, *Les Lois de l'Imitation*. Paris, Alcan, 1896.

² G. Tarde, *Les Lois sociales*, p. 36. , Paris, 4th edition, 1905.

which, originally, were confined to a restricted number of individuals, or even to a single individual ; and which, in the course of time, through the mechanism of imitation, have become vulgarised. Now, it is incontestable that imitation does play an important rôle in social life ; but it may be questioned whether the theory of Tarde can justly be termed a sociological theory. It may be more aptly described as a theory of *social psychology* ; and the ultimate explanation of the facts of social evolution, according to this theory, is to be found in the individual tendency to imitation. In other words, the social psychology of Tarde is but a formula of individual psychology prolonged and extended in space and time. The individual, in terms of social psychology—according to Tarde, at least—is the sole determining force in social evolution ; the existence of sociological laws *sui generis* capable of reacting on the individual and determining movements which otherwise would not have been produced is excluded. On the other hand, Durkheim has perhaps gone too far in the opposite direction. For just as Tarde seems to have failed to see that, when a number of individuals live together in society, a state of affairs is created which an individual alone could not have created, and which originates a new force, having its own laws, distinct from those of individual psychology ; so Durkheim seems to attach too little importance to the rôle of the individual in sociology. That a vast society, compounded and recompounded, cannot be explained by the laws of individual psychology is obvious ; but the individual does, nevertheless, play a rôle in sociology which cannot be denied. The circumstances of the actual phase of social evolution may aid the individual initiative, and the individual may but be taking advantage of circumstances which have been created quite independently of any individual will ; but, none the less, had not a powerful personality arisen at the psychological moment, these circumstances would not have been utilised, and the future phases of the evolution of a nation might have been quite

different. Had Napoleon not arisen, the destinies of France after 1796 might have been entirely different to what they were; and had a Napoleon, or some far-seeing statesman, been the heir to the throne of France in 1872, the monarchy would have been re-established, and the ominous clouds which now darken the French horizon would not be there; for it is known that the Comte de Chambord only missed becoming King because, with short-sighted obstinacy, he declined to accept the tricolour flag as his emblem.¹ But this golden opportunity of bringing France back to her traditions was lost, and events have since then pursued their inevitable course; for once the circumstances of a critical moment have been missed, the possibility of individual intervention is gone also. If the circumstances of a moment are favourable, a strong personality may be capable of utilising them so as to shape the future destinies of a nation; but if no such personality arises, the forces which social evolution has called into action do not wait, but continue to develop in virtue of a necessity which the individual is incapable of controlling.

We therefore assume the autonomy of sociology as our starting-point. The individual who, taking advantage of certain circumstances which result from the convergence of a number of social forces at a given point, is able to give a new impulse to these forces, so as to set them working in a fixed direction; is himself a product of the social forces which he finds at his disposition, and which have evolved and moulded the individual himself without his intervention. Social evolution is like a rolling ball which, having been set in motion down a slope, continues its way; at places the slope may be less steep, and at this very spot an individual may be standing, ready to check the further progress of the ball, and to give it a kick in

¹ *Vide* A. Debidour, *L'Église catholique et l'État sous la troisième République* (Paris, Alcan, 1906), for an interesting account of the events which followed the establishment of the Republic in 1871—interesting even for those who entirely disagree with the author's political views.

another direction ; but very often the kick is so forcible that the individual who delivered it cannot stop the ball again, and the latter may run along a path which he did not foresee ; it will continue its career until it encounters an obstacle, which it will either, by its momentum, dislodge, or which will stop its course, and compel it to find another. Thus, while the *rôle* of the individual in history cannot be overlooked, neither must it be forgotten that the social organism possesses forces which are inherent in it ; and which not only are capable of acting independently of the individual will, but which often bear the individual in their sweep ; while the latter fondly imagines that he is determining the course of social evolution.

I.

To turn now to the subject before us, namely, the increase in the rate of suicide, we shall find that this increase is not only very marked since the middle of the nineteenth century, but that it is a constant feature of the social evolution of all the countries included in the category of Western civilisation. All statisticians are in agreement on this point. According to Durkheim the increase has been on the following scale :¹

					Per 1,000 of Total Increase of Population.
Prussia	..	..	..	..	411 (1826-90)
France	..	..	..	..	385 (1826-88)
Austria	..	..	..	..	318 (1841-77)
Saxony	..	..	..	..	238 (1841-75)
Belgium	..	..	..	..	212 (1841-89)
Sweden	..	..	..	..	72 (1841-75)
Denmark	..	..	..	..	35 (1841-75)
Italy	..	..	..	..	109 (1870-90)

We may add that the figures given by the Registrar-General in his Annual Report for 1900 show that during twenty years, from 1880-1900, the increase in the rate of suicide in England and Wales was 45 per cent.

¹ E. Durkheim, *Le Suicide*, p. 420.

Professor Westergaard, of Copenhagen, has given us the following figures :¹

NUMBER OF SUICIDES PER MILLION OF INHABITANTS.

Country.	1865-69.	1880-86.	1887-93.	1894-98.
Ireland	15	22	25	31
Norway	77	67	64	60
Sweden	83	98	125	159
Italy	28	47	54	63
England and Wales	67	76	82	92
Austria	71	164	161	164
Prussia	139	200	200	200
Saxony	297	375	324	307

From this table we see that Norway is the only country which presents the phenomenon of an absolute decrease in the rate of suicide ; between the periods 1865-69 and 1894-98 the number of suicides per million of inhabitants has fallen from 77 to 60. In Saxony, which is the classical land of suicide, the figures have fallen from 375 during the period 1880-86 to 307 in 1894-98 ; but the latter figures are, nevertheless, slightly higher than those of 297 for the period 1865-69 ; in any case, the total of 300 suicides per million of inhabitants as an average per annum during a period of four years is enormously high. In all the other countries under observation the increase has been regular and enormous.

Professor Wirminghaus has endeavoured to find the exact number of suicides in France during more than half a century ; he has divided the sixty-seven years under consideration into fifteen periods, and the figures he gives are instructive :²

1826-30 ..	1,739	1851-55 ..	3,639	1876-80 ..	6,259
1831-35 ..	2,119	1856-60 ..	4,002	1881-85 ..	7,339
1836-40 ..	2,574	1861-65 ..	4,661	1886-90 ..	8,286
1841-45 ..	2,951	1866-70 ..	4,990	1891-92 ..	9,042
1846-50 ..	3,446	1871-75 ..	5,276	1893	9,043

¹ H. Westergaard, *Die Lehre von Mortalität und Morbilität*, p. 647. Jena, 1901.

² A. Wirminghaus, Art. *Selbstmordstatistik* in *Wörterbuch der Volkswirtschaft*, vol. ii., p. 500. Jena, 1898.

There has thus been an uninterrupted increase in the total number of suicides since 1826, when the total was 1,739, up to 1893, when the total was 9,043.

If we take the Annual Reports of the Registrar-General for Births, Deaths, and Marriages, during the years 1880-1900 inclusive, we find that the increase of suicides at all ages has been as before mentioned, about 45 per cent. for England and Wales :

SUICIDES AT DIFFERENT AGES IN ENGLAND AND WALES, 1880-1900.¹

Year.	Total.	Ages.										
		5.	10.	15.	20.	25.	35.	45.	55.	65.	75.	85.
1880	1,496	—	2	29	75	196	267	338	350	196	40	3
1881	1,476	1	5	41	64	210	291	332	301	182	47	2
1882	1,446	—	7	40	62	200	273	307	308	177	59	3
1883	1,445	—	4	37	77	192	325	296	300	167	42	5
1884	1,550	1	11	30	68	227	284	315	332	214	64	4
1885	1,529	—	4	27	70	208	298	361	317	197	41	6
1886	1,694	—	5	42	89	245	310	365	347	231	56	4
1888	1,732	—	10	43	89	239	335	367	359	230	56	4
1889	1,626	1	3	47	90	231	295	391	323	192	51	2
1890	1,635	—	6	38	92	277	314	338	298	209	55	8
1891	1,863	—	10	—	89	295	394	402	336	239	55	6
1892	1,907	—	8	53	116	318	365	394	339	238	69	7
1893	1,940	—	7	54	108	310	387	434	368	221	46	5
1894	2,052	—	10	52	122	315	440	438	393	228	50	4
1895	2,071	—	4	57	136	312	458	448	364	220	68	9
1896	1,979	—	9	57	99	319	407	437	392	196	60	3
1897	2,090	—	7	59	129	327	444	470	382	202	59	11
1898	2,166	—	7	53	134	334	470	466	424	225	52	1
1899	2,121	1	6	60	101	330	417	507	394	217	81	7
1900	2,166	1	9	43	107	369	463	477	409	218	67	3

The period of twenty years under consideration is a short one ; nevertheless, when we compare the number of suicides at all ages from ten to seventy-five inclusive which are reported in 1880 with the number reported in 1900, we find at once a notable increase.

¹ The figures here given relate only to the suicides among the male section of the population. During the same period the total of female suicides has risen from 483 (in 1880) to 730 (in 1900), an increase of 51 per cent.

Having thus satisfied ourselves as to the reality of the phenomenon, it remains for us to determine its causes. It may, at first sight, appear that the increase in the rate of suicide may be correlated with the undoubted increase in the rate of insanity, with which we shall deal in the following chapter. It is necessary, therefore, to warn the reader against any generalisation tending to confound these phenomena, and to see in suicide a mere manifestation of insanity, in the scientific sense of the word. In the first place, we may observe that if suicide were nothing more than the act of an insane mind, and if the causes of suicide were to be sought simply in the individual conditions of mental pathology, then the rate of suicide should be greatest in the sex, and also in those countries, which show a higher rate of insanity. But this is far from being the case. Suicide is a phenomenon of which the male sex possesses almost the monopoly, and if suicide be but an outward expression of the working of an insane mind, the participation of the male sex in the total quantity of insanity should be equally great. That this, however, is not the case is seen by an examination of the figures given by Durkheim relative to the share of the two sexes in the rate of insanity and in the rate of suicide :¹

RELATIVE SHARE OF THE SEXES IN THE RATE OF INSANITY, CALCULATED PER CENT.

Country.	Year.	Males.	Females.
Silesia	1858	49	51
Saxony	1861	48	52
Württemberg ..	1853	45	55
Denmark	1847	45	55
Norway	1855	45	56
France	1890	47	53
„	1891	48	52

These figures given by M. Durkheim concerning the respective share of the sexes in the rate of insanity are confirmed, as far

¹ *Le Suicide*, p. 37.

as the County of London is concerned, by the Census Report for 1901. According to the returns furnished by this Report, the inmates of lunatic asylums within the County of London may be classified as follows :¹

		Total.	Males.	Females.
Public asylums	..	1,720	716	1,004
Private asylums	..	1,692	730	962

If we turn, on the other hand, to the figures given by Durkheim concerning the respective share of the sexes in the rate of suicide, we find the converse state of affairs. Whereas the number of insane women is greater than the number of insane men, the number of suicides among men is immensely greater than the number of suicides among women, as may be seen from a glance at the following statistics given by Durkheim :

Country.	Absolute Number of Suicides.		Percentage.	
	Men.	Women.	Men.	Women.
Austria (1873-77)	11,429	2,478	82.1	17.9
Prussia (1871-76)	16,425	3,724	81.5	18.5
Italy (1872-77)	4,770	1,195	80.0	20.0
Saxony (1871-76)	3,625	870	80.7	19.3
France (1871-76)	25,341	6,839	78.7	21.3
Denmark (1870-76)	2,485	748	76.9	23.1
England (1863-67)	4,905	1,791	73.3	26.7

If we take a more recent period in a given country, say England and Wales during the period 1897-1900, we arrive at a similar result :

	Total.	Men.	Women.
England and Wales (1897-1900) ..	11,409	8,543	2,866

Thus, whereas insanity is more predominant among the female sex than among the male sex, suicide is considerably more predominant among men. We see at once the danger of con-

¹ *Census of England and Wales, 1901* : County of London, p. 47.

sidering suicide too exclusively as an expression of insanity; and of making any hasty generalisation as to the correlation of these two phenomena.

If we turn now to the comparative statistics of suicide and insanity in different countries, we reach a similar result. In the following table we place the countries mentioned in order, according to the rate of insanity prevalent in each; but we find that the rate of insanity in each case by no means corresponds with the rate of suicide. Thus Norway, which has the greatest number of insane persons, comes but fourth in the number of suicides:

COMPARATIVE RATES OF INSANITY AND SUICIDE IN DIFFERENT COUNTRIES.¹

Country.	Number of Insane Persons per 1,000,000.	Number of Suicides per 1,000,000.	Place occupied by the Country—	
			In the Rate of Insanity.	In the Rate of Suicide.
Norway ..	180 (1855)	107 (1851-55)	1	4
Scotland ..	164 (1855)	34 (1856-60)	2	8
Denmark ..	125 (1847)	258 (1846-50)	3	1
Hanover ..	103 (1856)	13 (1856-60)	4	9
France ..	99 (1856)	100 (1851-55)	5	5
Belgique ..	92 (1858)	50 (1855-60)	6	7
Württemberg	92 (1853)	108 (1846-56)	7	3
Saxony ..	67 (1861)	245 (1856-60)	8	2
Bavaria ..	57 (1858)	73 (1846-56)	9	6

On looking at this table, we find that Denmark and Saxony, the classical lands of suicide, which occupy respectively the first and second places in the rate of suicide among the various European countries, occupy respectively the third and eighth places in the rate of insanity. On the other hand, Norway and Scotland, which occupy the first and second places in the rate of insanity, occupy respectively the fourth and eighth places in the rate of suicide. Indeed, the positions of Scotland and Saxony are, in each case, exactly inverted. Thus:

		Place occupied in the Rate of Insanity.	Place occupied in the Rate of Suicide.
Scotland	.. ..	2	8
Saxony	.. ..	8	2

¹ E. Durkheim, *Le Suicide*, p. 41.

We must, therefore, beware of following any tempting analogies between the determining causes of insanity and the determining causes of suicide. Not only is the female sex, which is most prone to insanity, less prone to suicide than the male sex ; but also those countries which betray a higher rate of insanity occupy a lower place in the rate of suicide, and *vice versa*.

It may be objected, nevertheless, that suicide is a phenomenon determined by heredity ; and numerous instances may be cited of families in which suicide appears to possess the hereditary constancy of a physiological character. Indeed, there are cases in which not only the phenomenon of suicide itself is a constant feature throughout successive generations, but also suicide at a given age. Thus Moreau, the eminent French alienist, cites the case of a family in which the male members of two or three successive generations committed suicide on attaining a certain age, which was identical in all cases.¹ Esquirol relates the case of a family in which three brothers committed suicide successively ; and Moreau gives an account of another family in which three brothers and a paternal uncle all put an end to themselves.² Nevertheless, it is to be remarked that almost all the observations which have been made of cases of alleged inherited tendency to suicide have been made by psychiatric specialists on subjects suffering from insanity. Now, insanity is perhaps the disease which possesses the greatest tendency to propagate itself by heredity ; and it may be legitimately supposed that the cases reported by specialists in lunacy are cases of insanity. The tendency to suicide which appears to be transmitted is but a peculiar form of insanity : it is the outcome of the working of an insane mind. In a word, insanity is transmitted, but not a peculiar suicidal mania. If insanity manifests itself under the

¹ Th. Ribot, *L'Hérédité psychologique*, p. 145. Paris, 7th edition, 1902.

² E. Durkheim, *op. cit.*, p. 75.

same form in successive generations, this is due to fortuitous external circumstances.¹

One might be tempted likewise to see in imitation an important determining factor of suicide. It is incontestable that suicide may be contagious. The history of the fifteen French veterans who, in 1772, hanged themselves one after another from a hook in an obscure courtyard of the Hôtel des Invalides in Paris is a typical case in point. Once the hook was removed, however, the suicides ceased. And this fact shows us that it was not only the suicide mania *per se* which was contagious ; it is evident that other factors, notably suggestibility, came here into action ; for once the hook had disappeared, the suggesting factor disappeared, and the list of voluntary deaths came to an end. We cannot, therefore, say that the fifteen suicides in question were caused by imitation alone.

In considering the question of the importance of imitation in prompting suicide, it is necessary to define the phenomenon of imitation itself, and we cannot find a better definition than that given by M. Durkheim : *There is imitation when an act has as immediate antecedent the reproduction of a similar act, previously accomplished by another, without any intellectual operation whatsoever, either explicit or implicit, affecting the intrinsic character of the act reproduced, having intervened between this representation and the execution of the act.* Thus, the mere obedience to laws and customs and traditions is not imitation. The socialised individual does not, as a general rule, obey the laws and traditions of the society to which he belongs without an act of his individual judgment having intervened. The individual realises that disobedience to certain peremptory formulæ must entail serious inconvenience for himself. He accomplishes the act

¹ The whole theory of monomania—according to which a person may be insane on one point, and yet be otherwise of sound mind—is long since abandoned. The conception of the brain as divided into separate and independent faculties is contradicted by our actual knowledge of the cerebral structure and of the psychio life.

prescribed, not merely because another has accomplished it before him, but because the act in question possesses social sanctions. We shall see that, if any code of laws or traditions is to be effective, it is essential that the justice of these laws should be recognised by those subjected to them. The socialised individual is a conscious being; his conscience is a social creation, and it must necessarily play an important rôle in his social life. Thus, the obedience to traditional formulæ, to laws and customs, in a society possessing adequate integration, and in which such obedience is not merely verbal, presupposes an act of consciousness, of individual judgment. The reproduction of an act commanded by society is, therefore, not the automatic repetition of that act; for automatic repetition excludes consciousness. Imitation, on the other hand, is the automatic reproduction of an act without any intervention of individual judgment between the representation of the act to be reproduced and its reproduction. It is the repetition of an act without motivation, for the mere sake of repeating.

It is also obvious that the word "imitation" cannot be applied to those cases of social contagion which are included under the rubric of the psychology of crowds. A crowd of persons is assembled either for a definite purpose, or for no particular purpose at all; and, under the influence of what we may term social contagion, it is induced to commit an act or acts which were entirely unforeseen by any individual member of the crowd. For instance, the crowd assembled in October, 1906, at the Longchamps Racecourse, near Paris, under the impression that a race had been "faked" and the betters cheated, sacked and burned the betting-sheds. A sort of electric shock pervades the crowd at such a moment. Not one of the visitors to the Longchamps Racecourse had the slightest intention before he went there of sacking or burning anything; but the race was badly managed, the nervous excitement of some who had risked their money on it communicated itself to others, and as the nervous

excitement spread to an increasing number of persons it increased in force, and developed into uncontrollable passion. The quantitative change is accompanied by a qualitative one ; but there is here no reproduction of either actions or ideas. We are in the presence of a mutual interaction between the different members of the crowd, by means of which two or more similar states of conscience attract each other by reason of their resemblance. These two states of conscience finally absorb each other ; the process repeats itself indefinitely, until it has produced a collective state of conscience sensibly different to the original separate individual states. Thus, the result is diametrically different from that which imitation would have brought about ; for imitation, being the automatic reproduction of an action previously perpetrated, could only lead to the repetition of similar actions.

But it may be urged that imitation does play a rôle in prompting suicides, even when we restrict the meaning of imitation to the automatic reproduction of an act previously performed. We do not propose to deny that imitation plays a part in some individual cases of suicide. In the case of the fifteen veterans already mentioned, who hanged themselves one after another from the same hook, it is certain that the example of the first victim, acting on the morbid temperament of the second, caused the latter to hang himself from the hook in question ; and, as we have said, suggestion played an important part in determining the fate of the remaining thirteen victims. Other cases of suicide might be given in which imitation was a determining factor ; but in order to appreciate the influence of imitation on the *social* rate of suicide, it is not sufficient to discuss individual cases, however numerous. We must take the population of a country in its totality, examine which regions of the country are most subject to the suicidal mania, and see by statistics whether these regions exercise an influence over the adjacent regions sufficient to increase the total number of suicides in these.

We must deal in a similar manner, not only with the provinces of one and the same country, but with different adjacent countries.

If we examine the map of Central Europe, we find an exceptionally high rate of suicide in the kingdom of Saxony (311 per million) and in Thuringia (303 per million). The wave of suicide suddenly diminishes in intensity in the four adjacent provinces. It is as if a wall were raised all round Saxony and Thuringia, against which the suicide-wave vainly beats, and by means of which it is held in check.¹ In Silesia the rate falls to 158·4 per million, in the Prussian province of Saxony to 227·6 per million, in Hesse to 167 per million, and in the Franconian Palatinate to 120 per million.² In the north we find the city of Hamburg, with its adjacent territory, marking a black spot; the Hanseatic domain has a suicide-rate of 300 per million. The province of Schleswig-Holstein, adjoining Hamburg in the north, has likewise a high suicide-rate, although inferior to that of Hamburg (228·3 per million); but Hanover and Mecklenburg, which form the eastern, western, and southern boundary, have suicide-rates of 153·4 per million and 167 per million respectively. Brandenburg, in Central Germany, has a suicide-rate of 204·7 per million; the frontier provinces of Pomerania and Posen, adjoining it in the north and east, have suicide-rates of 128·1 per million and 70·4 per million respectively.

Thus we see that imitation is not a determining factor of the social rate of suicide. If it were, how could it be that the wave of suicide, which rises with such tremendous force in Saxony and Thuringia, suddenly diminishes in the west on reaching the territory of Hesse, diminishes still further on reaching Nassau, and practically dwindles away once the boundaries of Westphalia and the Rhine province are crossed? How comes it that Würtemberg, with a suicide-rate of 170 per million, should be

¹ We have no figures for Bohemia, which bounds Saxony in the south.

² Figures given by Morselli, reproduced by Durkheim in his chart of Central Europe, *op. cit.*, pp. 130, 131.

unable to influence the adjoining State of Bavaria, in which the rate is but 60 ? How comes it that Hamburg should stand out so markedly, one black spot in the midst of a comparatively fair landscape ? How comes it that Posen should contrast so flagrantly with the adjacent provinces ? Posen has a suicide-rate of 70·4 per million ; it is bounded by three provinces—West Prussia, Brandenburg, and Silesia ; the suicide-rates of these provinces are respectively 107·5, 204·7, and 158·4 per million.

It is evident from all this that imitation does not exercise any appreciable influence on the social rate of suicide. We do not deny that some individual cases may be determined by it, although the *rôle* of suggestion in such cases must also be taken account of ; and suggestion is by no means the same thing as imitation. But we are not discussing the individual suicide : we are occupied here solely with suicide as a social factor, and we have satisfied ourselves that imitation does not in any way influence the variations in the suicide-rate of society.

That the social rate of suicide is dependent for its variations on other factors we will now endeavour to demonstrate. We shall find that the phenomena of the variation of the suicide-rate in adjacent provinces, which imitation cannot explain, become explicable when we consider an important feature in the social life of these provinces. We have selected Central Europe purposely ; because an examination of its suicide-chart not only suffices to refute the theory that imitation is a determining factor in the suicide-rate, but also gives us a clue to the meaning of those variations which we have noticed, and which imitation cannot explain. For Central Europe is noteworthy for the heterogeneous religious beliefs of its inhabitants ; and we shall see that the nature of the religious belief is a very important element in determining the liability of a given community to suicide.

The figures given on p. 197 show the respective liability of Catholic and Protestant communities to suicide ; and we see that the liability of Catholic communities to suicide is very

much less than that of Protestant communities. And here we have a clue to the meaning of those variations in the suicide-rate of adjacent provinces. If Posen, surrounded as it is by provinces having a high suicide-rate, nevertheless has itself an exceptionally low suicide-rate; this is due to the fact that Posen has a population which is preponderantly Catholic, whereas Brandenburg and Silesia—especially the former—have a population in greater part Protestant. Würtemberg's high suicide-rate does not pass the Bavarian frontier; and we may attribute this phenomenon to the fact that Bavaria is one of the most Catholic countries in Europe.¹ The figures given will help us to realise the respective influence of Catholicism and Protestantism on the social rate of suicide.²

An examination of these figures shows us that the suicide-rate in Protestant communities is, in every case, very considerably higher than that in Catholic communities. Whatever country we take, and whatever period we take, the same fact is always illustrated. And as the very basis of scientific observation is that no phenomenon in this world of ours is unconditioned, but that every effect has its cause, we must take for granted that so persistent an effect as the one above noticed must have an

¹ We may say at once that we have not, of course, the remotest intention of discussing the religious dogmas of either the Catholic or the Protestant Churches. We are not here concerned with the theological aspect of religion, but only with its social aspect. We are treating of Catholicism and Protestantism simply as sociological forces. Auguste Comte said long ago of the positive philosophy that its fundamental characteristic is "to consider all phenomena as subjected to natural laws, invariable in their nature . . . and to reject, as absolutely inaccessible and meaningless for us, the search after what are called causes, either primordial or final" (*Cours de Philosophie positive*, i. 12; Paris, 5th edition, 1892). We may say the same of sociology. For this science regards the variations in the social rate of suicide as phenomena subject to natural laws, as intimately bound up with the greater or lesser integration of society. As far as religion is a force determining such integration, it falls within the scope of sociology. But with the metaphysical or suprasocial principles of any religion sociology is, of course, incapable of dealing.

² E. Durkheim, *op. cit.*, p. 132.

equally persistent cause. We are therefore justified in declaring that the integration and cohesion of Catholicism, considered as a *society of believers*, is greater than the integration and cohesion of Protestantism considered as such.

It may be objected that, in some cases, the Jewish community

SUICIDE-RATE IN DIFFERENT COUNTRIES PER 1,000,000 INHABITANTS OF EACH RELIGIOUS DENOMINATION.

Country.	Protestants.	Catholics.	Jews.
Austria (1852-59) ..	79.50	51.3	20.7
Prussia (1849-55) ..	159.50	49.6	46.4
Prussia (1869-72) ..	187.69	69.0	98.0
Prussia (1890) ..	240.00	100.0	180.0
Baden (1852-62) ..	139.00	117.0	87.0
Baden (1870-74) ..	171.00	136.7	124.0
Baden (1878-88) ..	242.00	170.0	210.0
Bavaria (1844-56) ..	135.40	49.1	105.9
Bavaria (1884-91) ..	224.00	94.0	193.0
Württemberg (1881-90)	170.00	119.0	142.0

shows even less liability to suicide than the Catholic community. But this "objection" falls to the ground of itself. Had we contended that the theological basis of Catholicism is superior to the theological basis of Judaism, this objection might certainly be raised; but as we have not discussed principles which, being extrasociological in their nature, do not come within the scope of sociology, such an objection is necessarily valueless. The integration of the Jewish community is a well-known fact; and this high degree of integration can be explained when we come to consider the circumstances in which the Jewish communities in Europe are placed. From the earliest origins of our Western civilisation up to the present day the Jews have been treated as strangers, as outcasts, as enemies. They have been, during many centuries, subjected to persecutions which might reasonably have been expected to succeed in their object of extirpating the Jewish race. And yet, in spite of the deadly hostility of their environment, the Jews in Europe have sur-

vived. Surprise has been expressed at the fact that a race which is certainly physically inferior should have thus persisted. If anthropological characters are only factors determining the course of social evolution; if racial characteristics alone have moulded our civilisation into shape; if, as the anthropo-sociological school asserts, there are races of masters and races of slaves, distinguished by certain well-defined anthropological traits; and if the destinies of humanity are in the hands of the dolichocephalous race, who are to assert their supremacy at the expense of the brachycephalous race; if these postulates of the anthropo-sociological school are accurate, the problem of the persistence of the Jewish race in Europe is a problem very difficult to solve.¹ But the grounds on which this theory of

¹ The anthropo-sociological school traces its origin back to the Comte de Gobineau, author of the remarkable *Essai sur l'Inégalité des Races Humaines* (Paris, 4 vols., 1853). The leading representatives of the school to-day are M. G. Vacher de Lapouge in France, and Professor Otto Ammon in Germany (vide G. Vacher de Lapouge, *Les Sélections sociales*, Paris, 1896; *L'Aryen*, Paris, 1899; also O. Ammon, *Die natürliche Auslese beim Menschen*, Jena, 1893; *Die Gesellschaftsordnung und ihre natürlichen Grundlagen: Entwurf einer Sozialanthropologie*, Jena, 1900. An important and valuable work is that of Rön, *Beiträge zur europäischen Rassenkunde*, in *Archiv für Rassen und Gesellschaftsbiologie*, Berlin, 1905-06. The author has measured upwards of eighty thousand persons in Germany and Scandinavia.) The doctrine of the anthropo-sociological school to the effect that the race factor dominates every other factor in the history of society; that the racial differences are fundamental and permanent; and that the superior race, which the anthropo-sociological school identifies with the Aryan race, must jealously preserve itself from contamination by intermingling, if the level of the human species is not to be degraded—this doctrine, we say, has found considerable acceptance in Germany. The Pangermanic party has found scientists to justify the political aims of the Pangermanists in the name of anthropo-sociology. Starting from the idea that the superior dolichocephalous Aryan race is the stock from which the Germanic race of to-day is descended, they have endeavoured to prove that the only nation in which the Aryan blood of the ancestors has been preserved in comparative purity is the German nation; from this hypothesis to the corollary that the German nation is destined, by reason of its anthropological superiority, to absorb in itself all the Germanic elements which are not as yet included in the German Empire, there is only a step. It is the duty of the Germans of the Empire, who

anthropologically superior and inferior races is based appear very insufficient.¹ We shall understand the survival of the Jewish communities in Europe better if we consider the Jews as a race possessed, in a remarkable degree, of the power of adaptation to their environment. The laws of the Middle Ages excluded the Jews from all professions in the service of the State. A race which lacked the adaptive capacity of the Jews, and which had been thus handicapped in the struggle for existence, would have died out. But the Jews, prohibited from entering the service of the State, shut out from every recognised profession, rendered incapable, in some countries, of acquiring fixed property, none the less succeeded in adapting themselves to the very

possess among the Germanic peoples the greatest proportion of uncontaminated Aryan blood, to break down the boundaries which political necessities have artificially set up, and to bring about a fusion of all the Germanic peoples within a new Holy Roman Empire. Among the countries thus reckoned as Germanic, and which are to be absorbed, are Austria, Switzerland, Belgium, Holland, and the north-eastern provinces of France (*vide* J. L. Reimer, *Ein Pangermanisches Deutschland: Versuch über die Konsequenzen der gegenwärtigen wissenschaftlichen Rassenbetrachtung für unsere politischen und religiösen Probleme*, Berlin and Leipzig, 1905; K. von Strantz, *Das verwelste Deutschum jenseits der Westmarken des Reiches*, Berlin and Leipzig, 2nd edition, 1903; H. Daniel, *Leitfaden für den Unterricht in der Geographie*, Halle, 1904). The edition which we have of the latter work is the 241st. It is a manual of geography for use in the State schools, and the number of its editions is sufficient proof of its popularity. This book—from which tens of thousands of German children have learned their geography during the last thirty years—teaches, as a proved fact, that the *German* countries of Europe, of which the German Empire is the principal, consist also of Austria, Lichtenstein, Switzerland, Luxembourg, Belgium, and the Netherlands.

¹ There is certainly an element of truth in the doctrines of the anthropological school of sociologists. It is undoubtedly true that the division of the population of Europe into Germanic, Slav, and Latin races is inaccurate; for these divisions correspond to the *culture* of the respective groups, but not to any anthropological classification; and it is an abuse of terms to apply the word "race" to a group absolutely lacking in homogeneity of type, as is especially the case with the so-called Latin race. The classification which M. de Lapouge gives of the European races agrees with that of anthropologists in general. For instance, M. Paul Topinard

difficult circumstances in which they were placed. Little by little they concentrated the financial resources of each nation in their hands, until they acquired complete control over the money market. Driven from all other fields of activity, they betook themselves to the one sphere in which they could act; and their activity in this sphere has proved such that the anti-Semitic movements in all the nations of Europe have had no appreciable result. But even this extraordinary adaptability of the Jews would have, in all probability, proved useless in the face of such tremendous difficulties had not the integration of the Jewish community throughout Europe been sufficiently great to bring home to the individual Jew in every land a con-

divides the white races into four groups. "The first, dark, small, and dolichocephalous, includes the peoples of the Mediterranean . . . consequently the Greeks and Romans, the Berbers and the Egyptians, as well as all the linguistic Semitic populations, both ancient and modern. The second, dark also, but of relatively tall stature, includes the conquerors of the Vedic epoch in India, the Persians, and some others. The third includes the brachycephalous Celto-Slav races. . . . The fourth is the dolichocephalous race, fair-haired, and of tall stature, which actually predominates in Northern Europe" (*L'Anthropologie et la Science sociale*, pp. 227, 228; Paris, 1900). According to M. de Lapouge, the fair dolichocephalous race, which he terms *Homo Europæus*, and which he identifies with the Aryan race, is predominant in the British Isles, in Northern Belgium, in Holland, in Prussia, in Denmark, in Scandinavia, and in Iceland. The Celto-Slav race, which he terms *Homo Alpinus*, is predominant throughout Western, Central, and Eastern Europe, from the Atlantic to the Caspian Sea. Spain and Italy (south of the Arno) are inhabited by a dark dolichocephalous race, which Lapouge terms *Homo Contractus*, and which he is inclined to consider as a product of intermingling. All these anthropological and ethnographical facts which Lapouge and the anthropo-sociological school rely on are perfectly accurate. But we cannot say the same of the sociological conclusions which this school draws from them. In the first place, it is certain that no such thing as purity of race exists anywhere. Lapouge himself admits that the absolute purity of race is a theoretically impossible conception, as every individual derives his origin, at the twentieth generation, from over a million ancestors, and inherits but one-millionth part of his patrimony from each ancestor. After this admission, how is it possible to prove that there exist well-defined races, separated by differences which are fundamental and permanent? This single objection appears to us fatal to the main argument of the anthropo-sociological school.

sciousness of his essential solidarity with all his co-religionists. Surrounded by actively hostile elements, the small number of Jews scattered over the European continent, between the Volga and the Atlantic, necessarily held together. The very conditions of inferiority in which they were placed as regards their competitors in the struggle for existence made solidarity a *sine qua non* of survival for the Jews. It is notorious that a society, numerically weak but strongly integrated, more than compensates its numerical inferiority by its virtues of integration and cohesion. The integration of the Jewish community in Europe, a necessary consequence of the solidarity among the Jews of all lands, has enabled this community to survive all the obstacles placed in the way of its evolution. And as a society which is strongly integrated will be the more protected against suicide in proportion as its integration and cohesion are great, it is evident that the rate of suicide among the Jews must be low. The figures which we have given show this to be the case.

The small numbers of Jews, and the peculiar nature of the circumstances in which, as aliens, they are placed with regard to the environing Christian civilisation, explain the high degree of social integration possessed by the Jewish community. But on looking at the figures given above, we will see that, in the majority of cases, the suicide-rate among Catholics is inferior to that among Jews. We are thus justified in assuming that the integration of the Catholic Church is even superior to that of the Jewish community. And the degree of integration possessed by the Catholic Church must not only be judged from the comparison between the number of suicides among a million Catholics and the number of suicides among a million Jews; but also from the comparison between the conditions of existence in which the two communities have been respectively placed. The desperate nature of their struggle for life in the midst of an hostile environment explains the strong cohesion of the Jewish community. The Catholic Church, placed in

far more favourable circumstances, possesses even stronger cohesion. As the influence of environment is not sufficient to explain, in the case of the Catholic Church, a cohesion which, among the Jews, is undoubtedly due to environmental pressure; we must conclude that the internal organisation of the Catholic Church, and the principles on which that organisation is based, ensure a very high degree of integration.

The immunity afforded by Catholicism against suicide can be still better appreciated after an examination of the following figures, showing us in detail the comparative suicide-rates in provinces of the kingdom of Prussia, according as these provinces are preponderatingly Catholic or preponderatingly Protestant. The figures are those of Durkheim (*Le Suicide*, p. 151), and have been compiled by him from the official statistics. They differ slightly from those of Morselli concerning the comparative geographical distribution of suicide. Morselli's suicide-chart of Central Europe, which Durkheim has reproduced, agrees, however, in every respect with Durkheim's comparative statistics.

COMPARATIVE SUICIDE-RATE IN DIFFERENT PROVINCES OF THE KINGDOM OF PRUSSIA.

Provinces containing more than 90 per Cent. of Protestants.	Suicides per 1,000,000 Inhabitants.	Provinces containing from 80 to 98 per Cent. of Protestants.	Suicides per 1,000,000 Inhabitants.	Provinces containing from 50 to 40 per Cent. of Protestants.	Suicides per 1,000,000 Inhabitants.	Provinces containing from 32 to 28 per Cent. of Protestants.	Suicides per 1,000,000 Inhabitants.
Saxony	309.04	Hanover	212.03	West Prussia	123.09	Posen	96.4
Schleswig-Holstein	312.09	Hesse	200.30	Silesia	260.02	Rhine Province	100.3
Pomerania	171.05	Brandenburg with Berlin	296.30	West-phalia	107.05	Hohenzollern-Sigmaringen	90.1
—	—	East Prussia	171.03	—	—	—	—
Average	264.60	Average ..	220.00	Average	163.06	Average ..	96.6

The above statistics show only two exceptions. Pomerania, which contains over 90 per cent. of Protestants, ought by virtue of its suicide-rate to belong to the second category instead of

the first ; and Silesia, on the other hand, with a population equally divided between Protestants and Catholics, has a higher suicide-rate than the average of the third category. But these two exceptions do not in any way affect the validity of the statistics. If we look at the average rate for each category, we cannot avoid seeing the general suggestiveness of the statistics. As the proportion of Protestant inhabitants decreases, the average suicide-rate diminishes. The first category, with over 90 per cent. of Protestant inhabitants, shows an average suicide-rate of 264·6 per million of inhabitants. The fourth category, in which the proportion of Protestant inhabitants is only 30 per cent., shows an average suicide-rate of 95·6 per million. It may be objected that the high suicide-rate of Saxony is due to the fact that this province is highly developed from the industrial point of view. The conditions created by industrial development and economic expansion, by intensifying the struggle for life and increasing the number of those who depend for their existence on the work of their hands, undoubtedly have a very great influence on the suicide-rate of society, and tend greatly to augment it. But these conditions can be counterbalanced by integrating factors operating in an opposite direction. For the provinces of Westphalia and the Rhine are very markedly industrial ; and yet Westphalia has a suicide-rate of only 107·5 per million, and the Rhine Province of 100·3 per million. On the other hand, Schleswig-Holstein, Western Prussia, and Hohenzollern-Sigmaringen, are all of them agricultural provinces ; industrial development may be said to have attained about the same level in all three. Nevertheless, Schleswig-Holstein has the very high suicide-rate of 312 per million, whereas West Prussia has a suicide-rate of but 123 per million, and Hohenzollern-Sigmaringen of 90 per million.

It may be said that Morselli's figures concerning the comparative geographical distribution of suicide mentioned on p. 194 do not agree with those given in the above table. But, with the

sole exception of Silesia, the difference is infinitesimal, and can easily be explained by the difference of the periods which Morselli and Durkheim respectively treat of. And the objection would entirely disappear were we to draw up a suicide-chart on the basis of the table above given, and compare it with the suicide-chart drawn up by Morselli. We should find the dark and the light spots on each chart to coincide. Thus, the suicide-rate, very high in Saxony, falls in each case towards the west; diminishing considerably in Hesse, and reduced to a very small proportion in Westphalia and the Rhine Province. The dark spot which would mark Brandenburg on each chart lightens in Silesia, lightens still further in West Prussia, and disappears entirely in Posen. It is true, as we have said, that the calculations of Morselli and Durkheim differ sensibly with regard to Silesia. The former estimates the suicide-rate of Silesia at 158 per million, the latter at 260 per million. Yet when we compare the respective figures of both statisticians with regard to the provinces bordering on Silesia, we find the proportion between Silesia and the adjacent provinces to be maintained. Thus, according to the two sets of statistics, the proportion between Silesia and Brandenburg remains practically the same :

			Morselli.	Durkheim.
Silesia	..	..	158·4	260·02
Brandenburg	..	..	204·7	296·03

We may thus state, as a first conclusion, that *Catholicism affords greater protection against suicide than Protestantism does*; and, as the rate of suicide diminishes with the increase of social integration and increases as social life is disintegrated, so may we say that this greater liability of the Protestant community to suicide results from a lack of integration and cohesion among societies which are Protestant. Similarly, the greater protection afforded by the Catholic community against suicide results from the high degree of integration and cohesion among societies which are Catholic.

II.

Before proceeding to the theoretical considerations which justify the view that the suicide-rate of a society corresponds to the degree of integration of that society, we shall submit some additional statistics to broaden the empirical basis from which alone any scientific conclusion can be drawn.

Just as the suicide-rate varies according as the religious beliefs of different societies vary; so it varies also according as the stability of family life is great or not. Just as the religious institutions of a society are a factor in ensuring the integration of that society, which will diminish in so far as these institutions leave greater room for individualism to develop; so does the integration of the domestic institutions correspond to the general level of the integration of society as a whole. The greater the stability of family life, the smaller will be the number of suicides. The following figures will help us to appreciate the influence of family life on suicide :

INFLUENCE OF FAMILY LIFE ON SUICIDE IN BOTH SEXES (FRANCE, 1887-91).


SUICIDE-RATE CALCULATED PER 1,000,000 INHABITANTS OF EACH CATEGORY. (AVERAGE RATE DURING PERIOD OF FIVE YEARS.)

Bachelors of 45 years of age	975	Spinsters of 42 years of age ..	150
Married men with children ..	336	Married women with children	79
Married men without children	644	Married women without children	221
Bachelors of 60 years of age	1,504	Spinsters of 60 years of age ..	196
Widowers with children ..	937	Widows with children ..	186
Widowers without children	1,258	Widows without children ..	322

Let us briefly consider these figures.

Among the men, the suicide-rate is highest in the case of bachelors of sixty years of age; and this is but an *a posteriori* confirmation of an *a priori* hypothesis. For if the suicide-rate, as we have said, is a phenomenon closely connected with the integration and cohesion of society; and if it diminishes as the

stability of family life increases ; it necessarily follows that those who are most detached by their individual life from society and from family life will be those who have the greatest tendency to kill themselves. The bachelor of sixty years of age is precisely such a person. He can no longer hope to enjoy life to any considerable degree ; for the pleasures which are possible to the young man are no longer possible to him. Excluded from the activities or from the excitement which, in the case of young men with their future before them, is often capable of temporarily taking the place of more lasting pleasures ; deprived of the great consolation of hope by reason of his advanced age ; shut out from the joys and comforts of family life, the bachelor of sixty will necessarily feel himself detached more or less from all social ties ; he will necessarily be inclined to attach less value to life. Especially will this be the case if his existence has been one of illusions, of hope long deferred which makes the heart sick ; especially, also, will it be the case if, having no firm religious belief, he is cut off from all spiritual communion with a religious community, the immense social advantage of which is its ability to absorb the individual life, to render the individual conscious of his essential solidarity with the community of which he is a member. Seeing his hopes unrealised—and how many can say that all their hopes in life have been fulfilled ?—and having a sense of the illusions which life brings with it, he finds himself at the same time entirely detached from all those ties which could console and strengthen him in the evening of his life. He knows not the comforts, the joys, the hopes, which family life can procure even to the old ; and, being thus rendered conscious of his isolation, the illusions and tribulations of the past will affect him the more intensely. A sense of the uselessness of all further effort, of the non-value of life, will more and more take possession of his mind ; and, under these conditions, the destruction of that valueless life will appear to him a natural and welcome release.



We need not, therefore, be surprised at the fact that this category of individuals manifests a marked tendency to suicide. When we come to consider the two categories of married men, we find that the rate of suicide among them is $336 + 644 = 980$; which is practically the same as the total for bachelors of forty-two years (975). To this total of 980, however, the married men *with* children contributed only 336. The total of 336 is to 975 as 100 : 290. We may thus say that for every 100 suicides among married men *with* children there are 290 suicides among bachelors of the same average age. For in comparing these suicide-rates it is important to take the average age of the respective categories into consideration, because suicide has the tendency to increase *pari passu* with age; and the old are considerably more liable to it than the young. The average age of married men in France can be calculated as being forty-six years $8\frac{1}{2}$ months, so that the category of bachelors of forty-two years may be fitly compared with that of married men. We may, therefore, formulate our proposition as follows: *The coefficient of preservation of married men with children as against bachelors of the same average age is 100 : 290, or 2.9.*

To the total of 980 suicides on the part of married men in general, married men *without* children, as we have seen, contribute 644. Their coefficient of preservation, as compared with that of bachelors of forty-two years, is thus much less than the coefficient of married men *with* children, 644 being to 975 as 100 : 150. We may therefore say that *the coefficient of preservation of married men without children as against bachelors of the same average age is 1.5.*

The contrast between the suicide-rate of bachelors of sixty years and that of bachelors of forty-two years is very marked; much more so than the contrast between the suicide-rate of spinsters of sixty years and that of spinsters of forty-two years. Suicide is almost a monopoly of the male sex; but the proportional difference between 1,504 and 975 is far greater than that

between 196 and 150. The reason for this phenomenon is to be found in the contrasted nature of the conditions in which the two sexes are placed. The bachelor of forty-two is still a relatively young man ; he has still the will to fight, or to take refuge in those excitements which serve to cloak for a time the realities of an existence deprived of any permanent value ; he has still strength and energy enough to hope. But the spinster of forty-two is already an old woman. She has no longer any hope of fulfilling the highest duties of her sex—the duties of wife and mother ; the hope which can still spur the bachelor of forty-two to action, and inspire him with courage and ardour, is lost to the spinster. Between the bachelor of forty-two and the bachelor of sixty lies an immense gulf—a gulf not to be measured only by eighteen short years, but a gulf which separates the man full of hope, activity, and vigour from the man embittered by disappointment, disillusioned, and *blasé*. But the spinster of forty-two has already been disillusioned ; she has nothing further to hope for ; the days of enjoyment, of aspiration, of faith in life, of idealism, have already given way to days of disappointment and worry. Whether she be forty or sixty, the spinster has no further hope of founding a family ; between the spinster of forty and the spinster of sixty there is no such difference as that between the bachelor of forty and the bachelor of sixty. Hence, we can understand the fact that the suicide-rate among spinsters of sixty is but slightly in excess of that among spinsters of forty-two ; whereas between the two corresponding categories of bachelors the difference in the suicide-rate is very pronounced.

If we now look at the categories of widowers, we shall observe that the widowers *with* children have a suicide-rate of 937 per million. The average age of widowers in general is sixty-one years $8\frac{1}{2}$ months. If we compare the suicide-rate of widowers *with* children with that of married men *without* children, we see that the position of the former is relatively

better. We must bear in mind that the tendency to suicide increases with age. The average age of married men in general is forty-six years eight months ; that of widowers in general is sixty-one years eight months. As far as age is concerned, married men have a very great advantage in relation to suicide ; and this advantage becomes even more marked when we reflect that, if the average age of married men *in general* is forty-six years and two-thirds, this average is, in great part, determined by the age of married men *with* children ; for the category of married men *without* children includes all the young married men who, for one reason or another, do not choose to found a family immediately—in other words, the most important contingent in this category consists, not of those physically incapable of having offspring, but of those who have not had time to found a family. The average age of married men *without* children, therefore, must be calculated at not more than thirty-five years ; for the average marriage age is twenty-seven, and the average age of the father at the time of the birth of his first child is thirty-two. We see by these figures how numerous within the category of married men without children must be the body of young men who have not had time to found a family. If we thus reduce the average age of married men without children, and compare the suicide-rate of this category with that of the widowers *with* children, we shall see that the position of the latter is, as we have said, relatively better.

If we compare now the category of widowers *with* children with that of bachelors of sixty years of age, we find the total of 937 to be to 1,504 as 100 : 160. The coefficient of preservation (1.6) of widowers with children, as compared with bachelors of a corresponding average age, is greater than that of widowers without children, the total of 1,258 standing to 1,504 as 100 : 119. The coefficient of preservation of widowers with children, as against widowers without children, is approximately 100 : 135 (1.35).

What conclusion are we able to draw from our survey of the

above figures? In the first place, it is not the married state, *per se*, which affects the social rate of suicide. This is evident if we bear in mind that the category of married men *in general* has a suicide-rate of 980, which is practically the same as that of bachelors of a corresponding average age. Further, the number of suicides among widowers with children stands to that among bachelors of the same average age as 100:160; whereas the category of widowers without children has a coefficient of preservation of only 100:119, or 1.2. But married men *with* children contribute only 336 suicides to the total of 980; and the favourable position of this category is the more remarkable if we consider that the average age of married men with children must certainly be greater than that of married men without children, for the reasons already set forth. Married men without children have a coefficient of preservation, as against bachelors of forty-two years, of only 1.5; and this coefficient must be diminished if we reflect that the average age of the bachelors is higher than that of married men without children, which we have reckoned as thirty-five years. Married men *with* children, on the other hand, have a coefficient of preservation, as against this category of bachelors, of 2.9, or practically twice as great as that of married men without children. And the coefficient of preservation of married men with children, as against married men without children, increases if we take into consideration the difference in the average age of the two categories. Finally, what seems to prove conclusively that marriage, *per se*, does not afford any palpable protection against suicide is the fact, already noticed, that the relative position of widowers with children is better than that of married men without children.

But if this be the case, it will be said, how does family life act as a determining factor of social integration? The reply is obvious: Through the children. The married man with children has a home capable of influencing him in a far greater degree than has the married man without children. The

married man with children has a sense of responsibility which the married man without children has not and cannot have. The duty of bringing up and providing for offspring, the hope and consolation which offspring bring, produce an integration of the family life which would otherwise be necessarily absent. Men marry in order to found a family ; the founding of a family is the aim and *raison-d'être* of the institution of marriage ; and if this aim is not realised, the influence of married life on the individual cannot but be reduced in a corresponding measure. We are thus justified in our phraseology. It is not *marriage* which can be said to afford palpable protection against suicide, but *family life*. The man who is conscious of his responsibility towards his offspring ; who, in return for the efforts made by him on their behalf, is rendered supremely happy by them ; who is encouraged in hours of discouragement by the knowledge that he is working for a real object which transcends his individuality, and which is capable, in consequence, of giving that individuality a value which it could not otherwise possess ; whose faith in life in general is strengthened by his faith in the destinies of his children ; and whose courage is continually sustained by the hope that these children will achieve what he has had no time to achieve ; who is consoled, as the years roll on, by the knowledge that his life is not extinguished with the passing of his individual self, but that his children constitute a prolongation of his individual life beyond the limits of his own personality—this man will no longer be alone. He will form but part of a whole which is greater than he is, a whole which envelops his individual self, which reminds him, at every moment, alike of the responsibilities and of the rewards which his membership of this larger whole brings with it. And such a man will be less liable to commit suicide than the man who is not thus integrated in a larger whole, who lacks, consequently, the motives for living which a father of a family possesses.

We may, therefore, formulate the following proposition : *The*

integration of family life which marriage and the rearing of offspring bring with them diminishes the liability to suicide.

Although it seems certain that suicide is sometimes infectious among individuals, it is equally certain that imitation has never increased the total number of suicides to the extent of interfering with what we have termed the *social rate* of suicide. As M. Durkheim has remarked, "every society has, at each moment of its history, a well-defined liability to suicide."¹ The relative intensity of this liability, at any given moment, is measured by comparing the total number of suicides with the total number of the population of both sexes and of all ages. We shall find the social rate of suicide to be constant among the population of a country during long periods of time; indeed, the suicide-rate is more constant than the general mortality-rate. We shall find, also, that the variations of the suicide-rate appear to be governed by certain well-defined laws. Thus, if we examine the statistics of suicide in the various countries of Europe during a given period, we shall find, in the first place, a steady rise all over the Continent; we shall find, also, certain other phenomena manifested—for instance, a marked *decrease* in the suicide-rate in 1848 in the three countries most affected by the Revolution, France, Prussia, and Denmark; a steady rise in the suicide-rate in France from 1860 onwards—that is to say, from the most brilliant days of the second Empire on, until 1868, when the maximum is attained, followed by a sudden fall in 1869, in the year of political crisis and tension which preceded the war with Germany; an equally steady rise in the suicide-rate of Prussia, from 1866, the date of the triumph of Sadowa, on to 1870, when a brusque decrease is noticeable; and a steady rise in the suicide-rate of England and Wales, beginning in 1868, after the commercial revolution brought about by the new commercial treaties. Thus, these figures teach us already one

¹ E. Durkheim, *op. cit.*, p. 10.

great lesson, which is in itself sufficient to show that suicide is a social phenomenon which obeys laws *sui generis*, different from those governing individual psychology—namely, that an era of prosperity invariably brings about an increase in the suicide-rate; and that this increase is brusquely checked by the advent of a crisis, whether political or commercial. Let us take the three examples we have quoted :

Year.	France.	England and Wales.	Prussia.
1860	4,050	—	—
1861	4,454	—	—
1862	4,770	—	—
1863	4,613	—	—
1864	4,521	—	2,203
1865	4,946	—	2,361
1866	5,019	1,329	2,485
1867	5,011	1,316	3,625
1868	5,547	1,503	3,658
1869	5,114	1,588	3,544
1870	4,517	1,544	3,270
1871	4,490	1,495	3,135
1872	5,275	1,514	3,467

Thus, in the case of France, we see that the *apogée* of the Empire of Napoleon III., from 1860 onwards, is marked by an immense increase in the number of suicides. This increase remains constant until 1867, when there is a slight fall, due to the crushing of Austria and Denmark the year before, and to the tension and preoccupation in the French political atmosphere brought about by these events. The reaction of Sadowa did not last long; for we see in 1868 an abnormal rise in the suicide-rate, followed by a brusque fall in 1869, a fall due to the preoccupations which preceded the outbreak of war in 1870. The rise in the rate in 1868 is like an orgy between two depressions—those of Sadowa and Sedan.

In Prussia the exuberance of national pride following on the defeat of Austria in 1866 is reflected in the rise of the suicide-rate in 1867, a rise of nearly 25 per cent., and which continues until 1870. The decrease is still further marked in 1871. But

once the great national effort has achieved its object, the development of united Germany is heralded by a brusque increase in the suicide-rate in 1872.

In England and Wales the development of commerce following on the conclusion of the new commercial treaties in 1868 is marked by the sudden rise in the suicide-rate for 1868 and the years following.

The lesson we may reasonably draw from these figures is that every increase of national prosperity, in the three countries observed, has been accompanied by a corresponding increase in the suicide-rate. On the other hand, every crisis in the national life has been accompanied by a corresponding decrease in the rate. In France and Prussia we see the total number of suicides diminish during the years 1870-71, only to increase again in 1872, after the Franco-German War is over. What does this mean, if not that society, in France and Germany, was awakened to a sense of its responsibilities by the perils of war; and that the consequent integration of society resulting from this realisation of a common danger acted as a powerful check on the individualism which is at the basis of suicide, considered in its social aspects?

We may conclude from these figures that patriotism, like family life, like religion, is capable of acting as an inhibitory factor on the liability to suicide in any given society.

Before proceeding to examine in more detail the significance of suicide as a social factor, we may forestall an objection which may possibly be raised against our conclusion that Catholicism affords greater protection against suicide than does Protestantism. England, it may be said, is a Protestant country; and yet in England the increase of the suicide-rate is not out of proportion to the increase of the population. During the period 1880-1900, as we have seen at the beginning of this chapter, the increase of the suicide-rate, in males, was 45 per cent.; during these twenty years the population increased at the rate of about

44½ per cent. The suicide-rate has thus remained practically stationary ; and one may be tempted to infer from this that our statement as to the unfavourable influence of Protestantism on the suicide-rate of the community is not justified. We may reply that the influence exercised by the Anglican Church in the social sphere is far greater than the influence exercised by the Protestant Churches on the Continent, whether in Germany or in Switzerland. The reason for this phenomenon is to be found partly in the nature of the constitution of the Anglican Church, which has retained the ecclesiastical hierarchy of the Catholic Church ; and chiefly in the fact that, for the majority of Englishmen, the Established Church is one of the emblems of the national greatness. Religion according to the tenets of the National Church thus forms an integral part of the believer's patriotic creed. Even as in Spain seven centuries of warfare against the Moors and the followers of the Prophet brought about the closest alliance between religious belief and patriotic feeling ; so also in England, whether rightly or wrongly, the greatness of the British nation is associated with the virtues of the National Church. Between the time when the Moorish tribesmen conquered Spain for the disciples of Islam and the memorable day when Ferdinand and Isabella entered Granada in triumph, the Spaniards had been engaged in one long, continuous fight for their national independence. The national feeling was developed from this uninterrupted struggle against a common foe. The struggle to free Spain from the invader became identified with the struggle of the Cross against the Crescent. The religion of the Spaniard formed an integral part of his patriotic duty ; and all the great traditions of Spain are associated with the national religion, for the national cause in Spain was inseparably linked with the cause of Catholic Christianity. It was in the name of the Church that Ferdinand and Isabella undertook the conquest of Granada and the final liberation of Spanish soil ; it was with the sanction of the Church that Columbus sailed in search of the New World ; it was with the

blessing of the Pope that Hernando Cortes set out to conquer Mexico, and Pizarro to annihilate the dominion of the Incas of Peru. Thus, the Church of Rome, intimately associated with the spirit of patriotism in Spain, became herself a national institution. It is the same with the Anglican Church in England. The policy of Queen Mary in marrying the champion of Continental Catholicism, and in persecuting those who dissented from the Catholic faith; the submission of the national Parliament to Cardinal Pole, as Legate of the Papal See, at the end of Mary's reign; the Bull of Pius V., by which he, an Italian Prince, presumed to declare the Sovereign of England deposed; the war undertaken by Philip of Spain to reconquer England for the Catholic Church, with its triumphs, which may be regarded as laying the basis of England's maritime and commercial supremacy; all these, coupled with the recollection of the fires of Smithfield, of the atrocities which marked the campaign of Alva against the Dutch Protestants, with the fear that England's soil, too, would be violated by the Spanish invader and soaked with the blood of Englishmen, that England's independence would be destroyed by a foreign foe—all these events, we say, did but serve to link inseparably the cause of the nation with the cause of its religion;¹ and to such an extent has the national

¹ "A singular good fortune has been conferred on England, in that, in fighting for her own independence, she fought also for the Reformation. She was the chief bulwark of the latter; *it was during the long and desperate struggle for civil and religious liberty that she felt herself become great and powerful, richer, more independent, more redoubtable, more glorious*" (Laugel, *L'Angleterre politique et sociale*, p. 44, Paris, 1875). In an important work, recently published, on the psychology of the English people, M. Jacques Bardoux notices the value of the *social* action of the Church of England. "One must have lived among the English in order to appreciate the depth of that religious feeling which envelops politics, legislation, literature, philanthropy, education, morals. One must have penetrated into the churches, listened to the sermons, read the pious books, in order to understand the *moral value and the social usefulness of this religion of action*. . . . In encouraging the individual effort in the interests of the collectivity, and the national effort in the interests of Christianity, it has

cause become associated with the National Church that, up to the present day, it is necessary for the Sovereign to denounce expressly, in his coronation oath, certain dogmas of the Catholic Church; up to the present day every new generation has been taught, and in the future will continue to be taught, that the greatness of England must be ascribed to the fact that she threw off the yoke of a foreign power who sought to enslave her—the foreign power being, of course, the Papal See.

We have compared the case of England with that of Spain in order to show that religious dogmas *per se* do not play any rôle in the determining of social integration; but that, if it is to be effective, a religious dogma must be intimately connected with the circumstances in which the historical evolution of a nation has proceeded. Catholicism, which, by reason of the peculiar conditions in which the Spanish nation developed itself, was synonymous in that country with the national greatness; is synonymous, in England, with all that which is most menacing to national greatness. And yet the integration of English society is very great in comparison with that of some Continental nations. The Anglican Church is a strongly integrated body, exercising on the nation at large an incontestable influence. We must not, however, overlook the fact that interest in the Anglican Church has been immensely stimulated, since the middle of the nineteenth century, by the Catholic revival which originated in the Oxford movement, and which has done much to infuse renewed strength and conviction into the Establishment.¹ The position of the Church of England is essentially different from that of the Protestant Churches in Prussia, precisely

contributed to convince British opinion of Britain's providential mission" (J. Bardoux, *Essai d'une Psychologie de l'Angleterre contemporaine*, p. 78, Paris, 1906).

¹ This fact will be clearly appreciated after a study of the admirable work of Thureau-Dangin, *La Renaissance catholique en Angleterre au Dix-Neuvième Siècle* (Paris, 1903-06), the only complete history of the Oxford movement and all its consequences.

because the Anglican Church is a national Church. The case of England is another illustration of the fact we have insisted upon—i.e., that a strongly integrated religion, possessing a thorough hold on the community, is an effective safeguard against social disintegration, of which the increase in the suicide-rate is but a symptom. There is probably no country in which religion possesses greater influence over the population as a whole than England.¹

III.

Having examined these figures, let us see whether we can deduce from them any general sociological conclusion. It seems to us that the conclusion is evident. Suicide is directly dependent for its decrease or increase on the greater or lesser integration of society. A society which is strongly integrated and

¹ Morselli has calculated the average of suicides in the different States of Europe, according to the religion of these States. He has arrived at the following result :

AVERAGE NUMBER OF SUICIDES PER 1,000,000 INHABITANTS.

Protestant States	..	..	..	..	190
Indefinite (large minority of Catholics)	..	..	..	..	96
Catholic States	..	..	..	..	58
Greek Orthodox States	..	..	..	..	40

We see that Morselli entirely agrees with Durkheim concerning the greater protection against suicide afforded by Catholicism as compared with Protestantism. But, according to Morselli's calculation, the Orthodox States are still more greatly protected against suicide than the Catholic States. Nevertheless, this immunity of the Orthodox populations cannot be necessarily attributed to the superior integrating influence of their religion ; for the civilisation of these States of Eastern Europe is very different from the civilisation of the States of Western Europe. We cannot compare Russia or Servia or Bulgaria with Germany or Great Britain or France. Industrialism is, in Eastern Europe, still in its infancy ; consequently, social life there lacks the intensity which it possesses in Central and Western Europe ; and the degree of intensity of social life is a factor of great importance in the variations of the suicide-rate of a community. The immunity of the States of Eastern Europe, which are almost wholly agricultural, may be attributed to this fact ; for a civilisation based on agriculture is infinitely less developed than a civilisation based on industrialism (*vide* Morselli, *Il Suicidio*, Milan, 1879).

strongly coherent will show a diminished rate of suicide ; and the diminution of the rate of suicide will be greater according as the integration and coherence of society are greater. A society, on the other hand, which is but loosely integrated, in which coherence is reduced to a minimum, will show an increased rate of suicide.

In the living organism the desires of the individual must be proportionate to the means of satisfying them. If the individual wants exceed the individual's power of giving effect to them, of fulfilling them, of transforming them into concrete realities, these wants will become the source of proportionately great suffering. And as actions which are painful have an inevitable tendency not to reproduce themselves, desires which do not admit of the possibility of realisation will, in the course of time, cease to manifest themselves ; life, which constitutes the sum total of our desires, cannot fail to have its vitality reduced in proportion as those desires are suppressed.

In the realm of animal life inferior to that of man, the question of the capacity of the organism to satisfy its wants does not arise. For in the whole of this sphere the equilibrium between the needs of the organism and the capacity for assimilation possessed by the organism is maintained by the individual constitution itself. Once the individual has satisfied its material needs, the limit of its desires is reached. The wastage of the tissues is automatically repaired by rest and food ; and the constitution of the individual sets a limit to its wants which cannot be passed. Once the individual animal has eaten sufficiently and rested sufficiently, there is for the time an end to its desires ; for the latter, being all of them dependent on the body, cannot exceed the physiological capacity of the body. An automatically adjusted equilibrium is thus reached between the needs of the organism and its capacities.

In the case of man matters are not so simple ; for the greater number of the needs of man are not dependent on the body, are

not purely physiological in their nature ; thus they are not subject to—or, at any rate, are less subject to—the laws which govern the physiological life of the organism. The quantity of food necessary to the sustenance of a human being we may calculate as determinable ; for although even the desires in this purely physiological domain are different, according as to whether the social situation of the human being is on a higher or a lower level, nevertheless there is a limit to the amount of food which an organism is able to assimilate. This amount differs according to the individual, and we cannot trace an arbitrary limit holding good for all the individuals of the human species ; but we may say that the physiological capacity for assimilation possessed by each individual constitution is limited, and the quantity of nutriment capable of being absorbed by it strictly determinable.

However, if even the materials necessary to the purely physiological life of the organism are in each individual case determinable ; there remains a vast number of desires which are not physiological in their nature, and which are not strictly determinable. Man differs from his predecessors in the animal world precisely in that his psychological life is so immensely developed as to constitute the most important part of his existence, the most valuable and the most durable part. And all the desires and needs of this vast sphere of human life are outside the domain of physiological law, and cannot be determined by physiological law. Let us take, for instance, the desire of luxury and comfort. Here we have a desire very general, it would seem, in human nature. How the desire for luxury has been developed in the course of ages since primitive man we cannot now inquire. It suffices for us that it is a desire which increases *pari passu* with the increase of social resources, with the development of social wealth. It is a desire which is psychological in its nature. And, we may ask, how are we to discover the manner in which this desire should vary in proportion to the profession or to the value of the services rendered by the individual to society ?

For in every society there is an hierarchy of individual desires corresponding to the constitution of the social hierarchy, and derived from it. The aspirations of the bricklayer are different from those of the hereditary nobleman. We give these instances only as an example of what we mean. The hierarchy of ideals and aspirations is in reality far more complicated, and falls into numerous subdivisions within each social class. And in every society the nature of these desires, and consequently the conception of their satisfaction, differ sensibly. The working-man in Russia or Roumania, or in Eastern Europe generally, is satisfied with a minimum which would seem absurd to a working-man of Great Britain ; and even in industrial countries so alike as England and France the standard of life of the middle and working classes is not identical. And yet human nature is essentially the same everywhere ; the difference in the physiological constitution of the Roumanian and the Englishman is utterly insignificant when compared with the difference in the aspirations and ideals of the two. Thus, in spite of the essential identity of human nature everywhere, whether in China or Persia, Germany or England, the standard of life and the ideological *Streben* of each society are markedly different.

We must necessarily draw the conclusion that the organic constitution of the individual is in itself incapable of limiting the psychological aspirations of the individual ; for the latter are not under that strict control of the constitution which we see illustrated in the case of the physical desires. The physical appetites of the body are mechanical in their nature, and find their natural equilibrium in the mechanical laws of life itself. The psychological aspirations of the mind are brought into being by consciousness ; they are not mechanical, but conscious in their nature ; and the mechanical equilibrium realised by those forms of life which have not yet arrived at the *consciousness of their own consciousness* is disturbed by the emergence of this new phenomenon.

It may be objected that psychology is but a branch of physiology ; that the psychical temperament of every individual is largely dependent on his physical capacities, which are inherited ; and that consequently the psychological tendencies of every individual are in harmony with his physiological organisation. The latter statement may be true ; but it labours under the disadvantage of being unprovable. Napoleon was small of stature, of weak health and physique ; he is even stated to have suffered from epilepsy ; and, at all events, from a strictly physiological point of view, he should be ranked as a *dégénéré supérieur*, to use a happy expression of Professor Magnan, the eminent French psychiatrist. Yet this degenerate organism contained a genius such as the world has seldom, if ever, seen. Napoleon's psychological development was doubtless in harmony with his physiological organisation ; but can we maintain that a degenerate *physique* is the condition of an extraordinary psychological development ? Obviously not. But if we are precluded by the extreme heterogeneity of the manifestations which the world presents us with from deducting any rule concerning the relation between the physiological and the psychological, how can we affirm that the psychological can be studied solely by reference to the physiological ? The relation which exists in every individual organism between the psychological and the physiological is an unknown and consequently undeterminable factor. Hence, it appears to us to be an abuse of terms to say that psychology is but a branch of physiology.

We may go further, and ask : Of what use is such a definition to the sociologist ? If psychology is to be reduced to a mere branch of physiology, much more, then, must sociology be so reduced. For sociology is the youngest science in that hierarchy which, having as its basis the science whose laws are most general in their nature, and as its conclusion the one whose laws are most restricted in their application, constitutes the great domain

of human knowledge. The science of astronomy is governed by mathematical laws ; but what differentiates astronomy, what makes it into an autonomous science, is precisely the possession of laws *sui generis* governing phenomena *sui generis*. In the same way, mathematical laws are at the basis of the physico-chemical sciences ; but phenomena with which the latter more especially deal do not come within the domain proper of mathematics. Because the more specialised sciences cannot be established independently of the more general laws which govern more generalised phenomena ; because sociology has to take account of the individual unit of society, and has to study the laws to which the psychological development of the individual conforms ; because the psychological activity of the individual, in its turn, is conditioned by the brain structure, which has to be studied as a physiological entity, and in relation to the physiological metabolism of the organism ; because physiology merges gradually into organic chemistry, which, in its turn, resolves itself into inorganic chemistry ; because, in the final instance, all phenomena, from the most general to the most special, from the most homogeneous to the most complicated, are governed by the universal law of gravitation ; are we justified in saying, therefore, that sociology is but individual psychology generalised ; that psychology is but a branch of physiology ; that physiology itself is but a complication of physico-chemical phenomena ; and that physico-chemical phenomena are but peculiar conditions of material equilibria which come within the scope of mathematical laws ? If we deny the right of sociology to autonomous existence by reducing it to a 'social psychology,' after the manner of Tarde, or the right of psychology to autonomous existence by reducing it to a branch of physiology, we likewise deny the right of every science, apart from mathematics, to autonomous existence ; and we shall be logical in reducing all phenomena, physico-chemical, physiological, psychological, social, to the one universal mathematical law of gravitation.

It may be objected that psychology is but a branch of physiology ; that the psychical temperament of every individual is largely dependent on his physical capacities, which are inherited ; and that consequently the psychological tendencies of every individual are in harmony with his physiological organisation. The latter statement may be true ; but it labours under the disadvantage of being unprovable. Napoleon was small of stature, of weak health and physique ; he is even stated to have suffered from epilepsy ; and, at all events, from a strictly physiological point of view, he should be ranked as a *dégénéré supérieur*, to use a happy expression of Professor Magnan, the eminent French psychiatrist. Yet this degenerate organism contained a genius such as the world has seldom, if ever, seen. Napoleon's psychological development was doubtless in harmony with his physiological organisation ; but can we maintain that a degenerate *physique* is the condition of an extraordinary psychological development ? Obviously not. But if we are precluded by the extreme heterogeneity of the manifestations which the world presents us with from deducting any rule concerning the relation between the physiological and the psychological, how can we affirm that the psychological can be studied solely by reference to the physiological ? The relation which exists in every individual organism between the psychological and the physiological is an unknown and consequently undeterminable factor. Hence, it appears to us to be an abuse of terms to say that psychology is but a branch of physiology.

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Such a proceeding may amuse the dilettante ; it is not scientific.¹

Obviously, if we consider the evolution of religious beliefs, of domestic institutions, of law and jurisprudence, of the economic forms of society, of political doctrines, simply from an individualist point of view, we can obtain no explanation either of the essence of all these products of social intercourse, nor of their influence. The sociologist must consider all these phenomena as the result of social life. There is a tendency to confound the *psychophysical* phenomenon with the *psychological* ; and this tendency leads to regrettable misunderstandings. The psychophysical phenomenon consists in the purely instinctive contact of individuals brought together by the external conditions of life, without having attained to that active consciousness of the

¹ It is one thing to apply the *method* of the anterior and more general sciences to the posterior and more specialised ones, another to reduce highly specialised phenomena *sui generis* to simple derivations, more or less complicated in their nature, of more general phenomena. When we say that mathematics, astronomy, physics, chemistry, physiology, psychology, and sociology, constitute the hierarchy of sciences ; that this hierarchy is based on the degree of generality of the phenomena peculiar to each of these sciences ; that the sciences whose sphere is more extended in space and time contain those whose sphere is less extended ; and that consequently mathematics, whose sphere is necessarily the most extended of all, because all phenomena obey certain mathematical laws, and depend on mathematical laws for their production, enter into the composition of all the other sciences—when we say this, we mean, from the practical point of view of the development of each science in particular, that the method employed in mathematical research is pre-eminently suited to all scientific research in all branches of science. The theoretical certainty that, in the hierarchy of knowledge, the special is included in the general, and is subordinate to it, entails the indispensable practical conclusion that the method employed in the latter is also the method of the former.

This view was also that of Auguste Comte, to whom we owe the enunciation of the admirable theory of the hierarchy of sciences. Writing with especial reference to chemical phenomena, Comte says : “ Any attempt to include the problems of chemistry in the sphere of mathematical doctrines must be characterised as profoundly irrational, and as being contrary to the nature of things ; such an attempt could only result from vague and essentially arbitrary hypotheses concerning the intimate constitution of

differentiation between the world of *ego* and the world of *non-ego* to which the human species—for reasons which are not yet quite clear—has alone attained. This active consciousness of a differentiation has, as a result, the establishing of a constant interaction between the two terms of *ego* and *non-ego*—interaction which is extremely fruitful in producing varied relations between the different individuals. The psychological phenomenon originates in this mutual interaction of heterogeneous mentalities; consequently, it finds its origin in social life itself. The vast host of sentiments, emotions, and desires which the socialised human being possesses are the fruit of intercerebral communication, of the opposition between numerous *egos*, or centripetal mentalities, and *non-egos*, or centrifugal mentalities. The psychophysical phenomenon we find manifested among

chemical elements. . . . I have shown the grave injury done up to the present to the science of physics by the abuse of mathematical analysis. But, in the case of physics, we were concerned only with the careless handling of an instrument which, if it were judiciously employed, is capable of rendering efficacious aid to physical research. On the contrary, it can be safely affirmed that . . . if the usage of mathematical analysis were to become as general in chemistry as it is in physics, it would inevitably cause, without any compensation whatever, an immense and rapid retrogression in the field of chemical research, in that it would *substitute vague conceptions for positive notions, and an easy algebraic verbiage for a laborious analysis of facts*” (*Cours de Philosophie positive*, vol. iii., p. 29). Some philosophers who hope to solve the riddles of social life and evolution by a more or less metaphysical synthesis, and without reference to facts, would do well to ponder these words of Augusto Comte.

With regard to the practical conclusion above referred to as resulting from the theory of the hierarchy of sciences, Auguste Comte remarks, also with reference to chemical phenomena: “If the immediate relations of chemistry with mathematical science . . . are necessarily limited from a doctrinal point of view, this is anything but the case with regard to the *method*. From this new point of view it is easy to recognise, on the contrary, that sufficient intimacy with the spirit of mathematics and the philosophy of astronomy would inevitably exercise the most salutary influence on the manner in which chemists conceive of, and cultivate, their science; and that it would, consequently, greatly accelerate the ulterior progress of chemistry” (*ibid.*, iii. 30).

various animal species, but it precedes social life ; the psychological phenomenon, which has its roots in the former, is manifested only by the human species, and is a product of social life.

Thus we may revert to our proposition that, although human nature, considered from a physiological point of view, is essentially identical everywhere ; nevertheless the ideological tendencies of different societies are markedly different. It follows, as we have said, that the organic constitution of human nature is insufficiently powerful to control these tendencies. The individual organisation cannot restrain tendencies and aspirations which, having originated in, and been developed by, a power which is superior to the individual—namely, the society—necessarily exceed the limits of individual control. Thus, as far as the individual alone is concerned, we may say that his desires and ideological wants are potentially unlimited.

To say that our desires are unlimited is to say that they are insatiable. And any desire which is insatiable must be the inevitable cause of suffering. For, although it may be maintained that progress is the law of life, and that life is synonymous with activity—which is exceedingly true—it still follows that progress, in order to justify its name, must be more than blind progress, must be a definite movement towards a definite end. Otherwise, we have no criterion whereby to judge if a given movement has conduced to a result intrinsically better than the starting-point ; and, where we imagine ourselves to see progress, we may all the time be moving in an endless circle. And, if life be synonymous with activity, nevertheless that activity must have an aim in view. Action for the mere sake of action will speedily result in fatigue and disappointment. To propose to oneself an end which can never by any possibility be reached, is to propose to oneself a useless expenditure of time and effort. And if, having proposed to oneself an aim which one thinks to be attainable, one discovers, after laborious striving, that this aim is in the clouds, and that the wish to attain it is folly—when

this is discovered, the discovery will bring weariness, bitterness, and a sense of the uselessness of all effort. No one who has thus struggled uselessly to attain a goal which is hopeless will be satisfied and consoled with the thought that a struggle has been accomplished. Action for its own sake is no stimulant ; the most energetic man must have before him, as the reward of his energy, the prospect of attaining something that is not illusory.

Insatiability may thus rightly be regarded as a never-ending source of suffering. For the more we obtain, the more we desire. Everything obtained does but serve to stimulate us to further action, until we find out the vanity of all this struggle ; and that discovery will but cause us to look upon life as one long torture ; it will engender pessimism and disgust. The socialised individual, left to himself, is condemned to never-ending suffering, because his ideals are utterly disproportionate to the means of satisfying them. His task is like that of Sisyphus rolling the stone ; he is perpetually on the move, like Eugène Sue's wandering Jew, searching to quench his thirst ; but the more he drinks, the greater is his thirst.

Insatiability, in an individual, is a symptom of moral instability. A society in which a large number of the members are conscious, more or less clearly, of the insatiability of their desires, of the consequent futility of all action, of all effort, will be a society characterised by the prevalence of nihilistic and pessimistic notions concerning life. For desire leads to action ; and desire and action together make up life. So that when we come to recognise the insatiability of our desires, and the consequent futility of all action, we will, at the same time, recognise life as devoid of all value, as a perpetual source of vexation and trouble.

In order to avoid the gangrene of pessimism, it is thus essential that we should put a check on our desires, that we should limit our aspirations. But the individual, as we have seen, is not capable of assigning a limit to desires and aspirations which,

having their origin in a power which is superior to the individual, far exceed the limits of individual control. The individual organic constitution contains no principle capable of controlling or holding in check forces which are immeasurably greater in space and time than the individual constitution. Clearly, then, the force which is to limit our desires must come from some principle which is external to the individual. And it is natural that the force which controls our desires and the aspirations of our psychical life, should be derived from the source which has engendered and developed all psychological phenomena—that is to say, from society itself.

It is necessary that a regulating power should control our psychological life, even as the organic constitution of the individual controls our physiological life. The human species alone has arrived at the consciousness of the fact that it is conscious ; and it is precisely this development of consciousness which has disturbed the equilibrium established in the organic world between endosmosis and exosmosis, or between assimilation and expenditure. In the organic world—to which the psychophysical and instinctive phenomena belong—the equilibrium is maintained automatically ; for the expenditure cannot exceed the assimilatory capacity without, sooner or later, causing death. But, as we have said, the psychological life of the individual is a social creation, and, as such, far exceeds the limits of the individual, whose organic constitution is unable to control it. Thus only a psychological power is capable of giving to the superorganic life that equilibrium which in the organic sphere is ensured by mechanical laws. The regulatory power of the *psychosocial* life of the individual—to use a term which denotes both the psychological and social character of these phenomena—must be a *conscious* power. Consciousness, having disturbed the pre-social equilibrium, is alone in a position to restore the equilibrium between the individual and his social surroundings. The material pressure of physico-chemical forces is useless

here ; such pressure can have no action on the emotional nature. The emotional nature can be disciplined only by a power which is moral. The individual must be able to consciously recognise the justice of such a controlling power. Such a power will be worse than useless if it cannot impose itself, not by brute force, but by moral suasion, by the confidence which it inspires in the fundamental justice of its principles. The individual, left to himself, cannot dictate such a law to himself. He cannot establish a control over his emotional nature, for the latter has been developed by a power far surpassing the individual. Society must intervene here and give to the emotional nature an equilibrium similar to that which the organic constitution of every individual gives to his organic nature.

As a matter of fact, at every period of history we find prevailing a dim recognition of the respective value of the different services rendered to society by different categories of individuals. And, concurrently with this estimate of the social value of the various classes of society, we find an estimate prevailing of the legitimate aspirations of each class. The working-man has set before him, by the tacit consent of society, a certain standard of life. If he does not rise to the level thus indicated, he is considered to be a failure, to have sunk below his natural condition. But if the working-classes, on the other hand, set up pretensions which are excessive, which cannot be satisfied without obviously infringing the rights of others, these pretensions will be checked by that moral power, the pressure of which is not less formidable because invisible—i.e., public opinion—that is to say, the conscience of society. The working-man, individually, is not prevented from improving his material condition ; but it is very generally considered that his social sphere is a sphere *sui generis*, which is not the sphere of a man with a University education. Within that sphere he may seek to improve his condition ; but if the working-man is content with certain conditions of life, it is not because his individual

constitution is different from that of his employer ; it is because centuries of tradition have created habits and customs and notions which, although not transmitted from generation to generation in the biological sense of the word—the Lamarckian doctrine of the transmission of acquired habits being, as we have seen, untenable—have, none the less, been transmitted throughout successive generations by means of education in the widest sense of the word. Tradition is the social form of heredity ; and tradition has ever been the restraining force in the evolution of society. Release the individual from the bonds of tradition, and we release him from the only power which can effect an equilibrium between him and his social surroundings.

Let us suppose the traditions of a society to be suddenly abolished. The individual, liberated from the weight of the accumulated habits, customs, and traditions of centuries, finds himself face to face with all the vast resources which have been developed *pari passu* with social evolution. Freed from all restraints, his one thought will be how to appropriate the greatest possible proportion of these resources. Up till that moment, the immense increase of social wealth was counterbalanced by the accumulation of social tradition. It is true that in proportion as wealth has increased, the desire of luxury, of comfort, has increased also. The standard of life of every social class has been raised since the beginning of the nineteenth century. None the less, the social hierarchy has been maintained, and this hierarchy is sanctioned by social recognition. The social sanction makes itself felt at both ends of the scale ; the useless luxury of the millionaire, the indolence of the parasite, is even more severely condemned by public opinion than the infractions of the law committed by the labourer ; and this greater severity is the merest justice, seeing that the consciousness of social duty should be developed in proportion to the education received ; and that the total lack of any such consciousness on the part of those who occupy high places in the social hierarchy is the

more unpardonable on that account. It is precisely the existence of this social hierarchy, this division of society into categories corresponding more or less to the social value—economic, intellectual, and moral—of the work performed by each category, which acts as a restraining power over the individual. The individual conforms his wants to the social estimate of the category to which he belongs. The working-man does not aspire to the standard of life of his employer ; the bank clerk is not filled with envy by the salary of the bank director ; the *bourgeois* has no taste for the sports and the general life of the nobility. Each is content with the standard of life prevalent in his sphere, provided that the standard of life conform to the general progress realised by social evolution. If the working-man to-day does not aspire to the standard of life of his employer, neither would he tolerate the conditions of labour which were prevalent sixty years ago ; if the servant does not aspire to lead the life of his master, neither would he submit to the régime of serfdom as it existed in the Middle Ages. But abolish all the customs and habits which make up social tradition ; convince the individual that there is no authority because all individuals are alike in their organic constitution ; and all restraint will be suppressed. Every one will consider himself entitled to the same share of the social resources. And the passions and desires thus set loose will only lead to fresh disappointment. For in the general rush for wealth, the natural superiorities must prevail ; and they will impose themselves with a brutality, the greater because all restraint is thrown off. The naturally strong will trample on the naturally weak, and the result will be the establishing of a new hierarchy.

We are thus enabled to formulate two general laws which govern the life of society. Firstly, it is essential that society, whether as a whole, or as embodied in a religion, or a political party, or a professional union, or otherwise, should exercise, at any given moment, sufficient influence over its component indi-

Especially will this be the case when society is in a permanent state of instability, of which economic perturbations are but a feature. The man who has laid aside reserves from which he can draw, and has thus practically insured his life against disaster, can face the hour of difficulty and trial with courage, if not with serenity. He who is supported by a firm religious belief which dominates every moment of his existence, is not discouraged by the loss of material fortune; for he will deem the welfare of the soul to be higher and more durable than any temporal interests. In the same way, all who have lived and worked for an ideal, whether religious, or social, or political, or professional, which to them is a living reality, find themselves fortified by their belief, and are better protected against the consequences of adversity. But in order that a belief may be able to act thus directly on the individual conscience, that belief must not be peculiar to the individual. It must be a belief incorporated in a concrete and coherent organisation, of which the individual is a member. In other words, a belief, if it is to exercise sufficient influence on society, must be a *socialised* belief. It must be a belief which enables the individual to realise his essential solidarity with all those who share the same belief; consequently, it must strengthen the ties which bind its adherents one to another. In a word, a belief, in order to attain the *maximum* of its possible effectiveness, must be incarnated in a society of believers.

In the history of Western civilisation during the last fifteen centuries such a society was realised by the Church. The philosophy of the Middle Ages co-ordinated all knowledge in a synthesis of which the Church was the centre. For the men of the Middle Ages, Western Europe was everything; and Western Europe was entirely filled by the Church, with her cathedrals and monasteries, with her lofty ideals and dominating fascination. The Church proved a mighty safeguard against the abuse of wealth and power, and also an invaluable consolation for the

poor and lowly. She consoled the latter with the Fatherhood of God, with the example of Jesus, with the hope of immortality. She checked the oppressor by reminding him that there was a Power greater than he, and that one day he would be called to account for his deeds. She restrained the avaricious exploiter by recalling the parable of Dives and Lazarus, by reminding him that the riches of this world are as nothing in the eyes of God. One can easily understand that the believer, in the hour of dire distress, found the great consolation of hope in his faith. But this faith was able to act on the individual conscience because it was *more than an individual faith*. A belief which is based on individual judgment alone can never prove adequate to the needs of the individual in the hour of distress ; for in that hour, precisely, the individual becomes conscious of his own insufficiency ; in that hour he seeks consolation and encouragement outside the limits of his individuality ; consequently, he can find no consolation or encouragement in a belief which, being based on his own individual judgment, does not transcend his individuality, and is liable to error in the same degree as the individual. A religion which adopts the individual judgment as its basis and starting-point cannot conduce to social integration ; as has been seen by the figures showing the respective influence of Catholicism and Protestantism on the suicide-rate of the community.¹

To-day, however, it is undeniable that the Church has lost much of her influence. And, concurrently with the diminution

¹ If it be objected that Germany, which is the land most affected by suicide, is nevertheless a prosperous land, and shows no signs of disintegration, we would reply : (1) Out of the sixty million of inhabitants in the German Empire, twenty million are Catholics, or one-third of the total. It cannot be said that Germany is an exclusively Protestant country. (2) If Germany be, to a great extent, an irreligious land, in the strict sense of the word, nevertheless a new faith has been substituted for the old faith. On the dry bones of German Protestantism has been built the great edifice of German patriotism. German patriotism, called into being by the disasters of 1806, won Waterloo in 1815, Sadowa in 1866, Sedan in 1870. German

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of this spiritual power, there has been a development of the economic activity of society truly prodigious in extent and rapidity. Formerly, as we have said, the Church exercised a salutary influence on the society which it dominated, by restraining the passion for lucre, by bridling the greed of gain, by conferring—through its doctrines of the Fatherhood of God and immortality—equal value to the life of the peer and of the labourer. On the other hand, the political power likewise employed every means to prevent the growth of a financial and commercial plutocracy, independent of the political power, and in reality superior to it. Especially in the case of France do we notice the efforts of the monarchy to maintain its rights, and to preserve these rights against any encroachment on the part of financiers and merchants. And, in the third place, the extreme protectionism of the guilds and corporations was in itself a great barrier to commercial expansion; furthermore, the policy pursued by the trading corporations in fixing the amount of salary to be paid to the workers, in deciding the price of the products to be sold, in regulating even the cost of production, tended to limit the demand. Nor can we overlook the obstacle to economic expansion presented by the lack of adequate means of communication.

To-day everything is changed. The Church, as we have said, has lost the influence she formerly possessed. The political power has become the handmaid of the economic power; and the latter has never ceased to increase its influence during the last hundred years. The French Revolution broke the power

patriotism founded the Empire. And patriotism it is which constitutes the link which binds the Empire together, which has made the Empire great, and which maintains its integrity. In no country except Great Britain is patriotism so highly developed as in Germany; and patriotism is capable of producing the same effects, as regards social integration and cohesion, as religion. (3) Material prosperity must not be taken as proving the moral stability of a society. It may but conceal the germs of social disintegration and decay, as it did in the case of Rome under Augustus.

of the Monarchy. The successor of Clovis and of St. Louis fell a victim to the Protestant Swiss merchant Necker. The Revolution was the triumph of the capitalist class, of the financiers and merchants, over the monarchy, the hereditary aristocracy, and the Church, all of which were so many barriers opposed to the formation of a dominating capitalist class within the State. After the Revolution, the State passed into the hands of the financiers. All the progress realised by the applied sciences during the nineteenth century has but served the cause of this new capitalist class. The development of the economic power at the expense of the political and ecclesiastical powers is the great historical feature of social evolution during the nineteenth century. This development of the economic power has proceeded with extraordinary rapidity; the Bank and the Stock Exchange have gradually conquered the world. Formerly, when the means of communication were so bad as to render trade even between neighbouring States precarious, the producer was not encouraged to produce more than a limited quantity. But to-day each producer has—potentially, at any rate—the entire world as his client. He does not any longer produce, as he did a century ago, for the neighbouring markets alone; his goods are transported with ease, precision, and rapidity to the ends of the earth, across thousands of miles of ocean. The telegraph, the telephone, the submarine cable, have further increased the power of the financial classes, and developed trade and commerce. Even as the seismological instruments at Greenwich can register the shock of an earthquake occurring at the other side of the globe, so does the Stock Exchange in London respond to the slightest political shock in Pekin or Constantinople or St. Petersburg. Not without reason has the Stock Exchange been termed the “political barometer.” And this popular expression alone suffices to show the power which the economic factor exercises over the political destinies of humanity to-day. Economic expansion, instead of being a means to an end—that

end being the moral and political welfare of society—has become an end unto itself. The prodigious growth of trade, and the enormous increase of social wealth which has ensued from this development, have awakened appetites and stimulated desires. Competition has become fiercer and more bitter. The struggle for existence has intensified tenfold. The desire to gain money, and to gain it quickly, has infected all the members of Western society. The political interests of a nation are identified with its economic interests, and are subservient to the latter.

We have already noticed that economic disturbances will have a disastrous influence on a society in process of disintegration. And economic disturbances tend precisely to become ever more and more frequent as economic activity increases. This phenomenon is an inevitable result of the development of credit and speculation, and of constant overproduction. The formation of trusts is not capable of putting an end to this excessive production. For, as the object of a trust is to endeavour to obtain a monopoly, and to limit the supply with the object of raising the price of goods, other trusts will be persistently formed to compete for the conquest of the market. Thus excessive production appears to be a feature inherent to the capitalist system of production; and excessive production must necessarily be a constant source of economic disaster.

But if economic disaster has, for reasons already set forth, a detrimental influence on the moral life of society, the same result is produced by a sudden increase of prosperity, power, and fortune. A too rapid increase of social wealth is as unfortunate for the stability of society as bankruptcy would be. And the same reasons which render economic disaster dangerous for social stability likewise render a too rapid increase of prosperity dangerous. The conditions of life are suddenly changed. The scale of individual desires has been altered. The boundaries which, by universal consent, separate the different spheres of society from one another, according to the estimate formed of the value

of the services rendered to society by each social category, have been broken down. The equilibrium of social life, which was effected by social integration and solidarity, exists no longer ; but a new scale of ideological values, corresponding to the new division of social labour, cannot be organised in a day. As long as the social forces thus liberated by the disaggregation of society remain without equilibrium, their respective values remain undetermined. In such a state of affairs, all individual desires and aspirations will have completely lost their orientation. Public opinion is disorganised, and can exercise no efficient action. And a society which lacks the solidarity necessary to impress upon each social category the limits within which the aspirations of its members may be considered legitimate—having regard to the general level attained by social evolution—is on the road to dissolution.

This condition of amoralism, so to speak, in which the equilibrium of social life has been upset, has become chronic to-day in one sphere of Western civilisation. As we have said, the history of the nineteenth century has been the history of the development of the economic power at the expense of the political and ecclesiastical powers. The schools of thought apparently most antagonistic to each other—the school of orthodox Liberalism and that of Socialism—are none the less agreed as to the supremacy of the economic factor in the life of society. But the economic sphere is precisely the sphere of social life which does not possess a principle of solidarity or integration. In the ecclesiastical sphere we have, as integrating principle, the Moral Law, of which the Church is the safeguard and the trustee, and which constitutes the criterion according to which the members of the ecclesiastical society must regulate their activities. In the political sphere we have the Fatherland as an integrating principle, symbol of common interests and common aspirations, to which the individual interests and aspirations must subordinate themselves. In the economic sphere, nothing of the

kind ; no social principle requiring the individual to regulate his activities and subordinate his desires in accordance with the interests of the society of which he is a member. On the contrary, individualism pushed to its farthest limits is the law of economic struggle. There is no moral law, no fatherland, no common interest which links together the competitors, which renders them conscious of their solidarity ; there is nothing but the clash of jarring interests. The law of economic struggle is : every one for himself. The fatherland of the capitalist and the trader is everywhere where speculation is profitable and where money is to be obtained.

Thus, in proportion as economic interests tend to dominate the life of society, the more the economic power develops at the expense of the political and ecclesiastical powers, the more the individual is cut adrift from those supra-individual principles which are the creation of social life, and which respond to the needs of the socialised individual. Here we see the contradiction inherent to the doctrine of economic individualism ; the socialised individual, with all the desires, wants, and aspirations which have been engendered by social life, by thousands of years of constant and uninterrupted psychological interaction, and which can find their limitation only in a principle similarly engendered by social life—the socialised individual finds himself deprived of the only means of limiting these desires which so greatly exceed the limits of his own individuality. These desires, unlimited as regards the individual constitution, are accentuated by the condition of struggle in which the individual is placed. The desire of wealth, of luxury, of power, of fame, whetted by the spectacle of extraordinary success in others, and still further excited by the general rise of the standard of life which follows on the increase of social wealth, seizes hold of the individual and society, in the absence of any integrating principle capable of defining the activity of its respective categories, presents all the symptoms of anarchy and disaggregation.

Every desire once attained is the starting-point of a new desire, as Schopenhauer has long since pointed out.¹ Only the individual who knows how to limit his desires, and how to regulate his activity, can hope to realise that enjoyment of life which alone renders the latter worth living. Otherwise he will be in a state of perpetual insatiability—that is to say, of perpetual suffering. Under the influence of this feeling of insatiability, the individual will incline to pessimism as regards the value of life. He will come to look upon the life of inaction, of *minimum* vitality, as the ideal life, in contrast to the life of desires and passions which are never satisfied. We have said that the only power capable of regulating the psychosocial life of the individual is society in one or other of its forms. But a society of individuals in which the Nirvana is held to be the goal of all life, in which pessimism and distrust of life prevail, is a society deprived of its regulating power. There where the philosophy of inaction and pessimism prevails, there are also the germs of social disintegration. A society in process of disintegration cannot exercise sufficient control over the individual ; so that social disintegration leads to individual nihilism, and the prevalence of nihilistic doctrines within a society is a symptom of decay and disruption.

Concurrently with the progress of economic development, with the *Hasten, Drängen und Jagen* of modern life, we find the pro-

¹ " Let us suppose a man whose will is fired by an unusually strong passion ; in vain, in the fury of his passion, he will seize hold of everything he can in order to appease his desire and to calm it ; he will inevitably discover that every satisfaction is but pure illusion, that the object which he possesses invariably falls short of the object which he desired, for it does not afford us any lasting satisfaction, any permanent appeasement of our desires ; he will find out that every desire which he imagines to be satisfied does in reality but change its aspect, and that it continually assumes new shapes in order to torture us the more ; and at last he will become conscious of the fact that, even if all tangible forms of desire were exhausted, the *want to wish* for something will still remain, devoid of all motives, and will reveal itself as a feeling of dreadful weariness, of absolute helplessness : atrocious torture !" (Schopenhauer, *Le Monde comme Volonté et comme Représentation*, vol. i., p. 381 ; French translation by Burdeau, Paris, 1903).


by the suppression of conflict or the increase of the material comforts of life. If suicide is on the increase, and if it is increasing with alarming rapidity, this is not because the efforts required to-day from the individual in the struggle for existence are more painful than they formerly were before the growth of industrialism; nor is it because the legitimate desires of the individual receive less satisfaction to-day than they received five hundred years ago. In proportion as industrialism has developed, the standard of life for each social class has risen also; for the standard of life within each class tends to reach a higher level with every increase of social wealth. The ever greater division of social labour has ensured an intensity of production unknown to our ancestors; and this prodigious development of the productive capacity of society has been for the benefit of all social categories.¹ The working-man is assured of a remuneration far in excess of that earned by the working-man a few decades ago; and as this greater remuneration permits a higher standard of comfort for the labouring community, we may say that it maintains the equilibrium between the greater expenditure of vital forces brought about by the development of the capitalist system of production and the repair of these forces. The equilibrium is disturbed by other factors connected with the biological and hygienic conditions of labour; but as far as labour alone is concerned, the remuneration has increased proportionately with the production.

The constant and rapid increase in the rate of suicide points, therefore, not to an increase of economic misery, but to an increase, and to an alarming increase, of moral misery—of amorality, as we have termed it. It is worse than useless to

¹ The celebrated *Verelendungstheorie* of Karl Marx, according to which the misery of the working classes increases with the increase of production and social wealth, has been generally abandoned by the modern Socialist school, as has also the theory of the concentration of capital in a few hands, and the consequent disappearance of the lower middle-class population, thrust by the evolution of capitalism into the ranks of the proletariat (*vide* notably E. Bernstein, *Socialisme Théorique et Socialdémocratie Pratique*, Paris, 1900).

endeavour to remedy this state of affairs by means of pious exhortations. In every other branch of science—whether mathematics, astronomy, physics, chemistry, biology, psychology—we are accustomed to search for a cause adequate to every effect. In sociology alone is this research of adequate causality often neglected, and we content ourselves with explanations wholly insufficient and highly improbable. When we speak of moral distress being curable by means of exhortations and advice, we appear to ignore the nature of moral distress, and to suppose that our exhortations possess some magic power of exorcising the evil. But the positivist method teaches us to search everywhere after causality ; and if we consider the moral constitution of a people to be a system of definite forces which cannot be disturbed or rearranged by means of simple injunctions, we must seek the remedy for our present condition of moral instability elsewhere.

The cause of amorality lies, as we have shown, in the excessive individualism which is a characteristic of the present phase of our Western civilisation. This individualism is the last term of a process of evolution, the tendency of which, throughout the history of society, has been the persistent destruction of the successive principles which have ensured the integration of the various social types by the adaptation of the individual to his social surroundings. At the beginning society was organised on the basis of the family ; it was constituted by the union of a certain number of smaller societies, or clans, and all the members of each clan considered themselves as related one to another. But this organisation does not appear to have lasted long in its primitive form. Very early already the family ceased to be a political unit, in order to become the centre of private life. The territorial group is substituted for the ancient domestic group. The individuals occupying the same territory acquire gradually, independently of all family ties, common ideals and morals, which differ in a greater or lesser degree from the ideas and morals prevalent among the inhabitants of the adjoining



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territories. Small social aggregates are thus called into being, the physical foundations of which are the common territory and the relations which ensue from constant intercourse. These simple aggregates, in their turn, combine and form aggregates of greater complexity ; but each one maintains its personality, so to speak, and constitutes the elementary segment of which society as a whole is but an enlarged reproduction. In proportion as this process of compounding and recompounding proceeds, the bonds which bind the primitive aggregates to each other are tightened ; the primitive aggregates gradually lose their personality, and become merged in the larger group of which they form a part. In France this process of absorption and centralisation was carried to completion by the Revolution of 1789. The *ancien régime*, by its policy of centralisation inaugurated by Louis XI., had prepared the way for the Revolution ; but before 1789 the provinces still maintained much of their personality, the soil of France was still divided against itself, and not all the intermingling of populations which necessarily followed on the development of roads and waterways had produced a complete effacement of ancient feuds. The Revolution pushed the work of levelling the provincial differences to an extent unknown before. The legal suppression of the ancient provinces, the creation of a multitude of new departments, the development of communication following on the invention of the steam-engine, have finally destroyed all traces of the old order of things, all that remained of the personality of the original social aggregates. In Germany the fusion of the heterogeneous principalities composing Prussia into a single Prussian kingdom accomplished the same work of centralisation as the Revolution accomplished in France. The gradual absorption, first of Wales, then of Scotland, and finally of Ireland ; the fusion of all the provinces of the Italian Peninsula under the Italian Crown ; and many other cases which we have not space to mention here, are further instances of this universal tendency of social evolution to destroy

the personality of the primitive social aggregates by substituting for them a State infinitely greater in extent, which absorbs them.

Thus, after the destruction of the family as the pivot of political life, after the destruction of the primitive territorial aggregates, we find the modern State constituted by the numerous and infinitely varied activities of these primitive groups which it has absorbed.¹ But the modern State, in its turn, threatens to be destroyed, and to lose its personality in a vast international organisation. The system of capitalist production is essentially international; and the State being to-day first and foremost an economic institution, and the political interests of the State being identified with its economic interests, the frontiers of the State tend to disappear, and to be merged into a single world-embracing economic institution. But at the same time as the State extends its boundaries to a point such that the State as we know it must disappear; at the same time that the development of production and the extension of the markets tend to efface more and more completely the heterogeneous national States, and to merge them into one homogeneous international State whose limits will be those of the international market itself; at the same time the State endeavours to embrace within its sphere of action an ever greater part of the individual's life. The old doctrine of *laissez-faire*, which presided at the foundation of the modern economic edifice, has itself become antiquated by reason of the proportions assumed by this edifice. Everywhere to-day we find the doctrines of State Socialism in favour; the State endeavours to bring home to the individual the essential identity of the interests of both; and with this aim in view the State undertakes to envelop the individual's life in such a way that the individual shall at every moment be reminded of the fact that the State is interested in his welfare. Already as a

¹ We are, of course, merely indicating the principal phases of social evolution. We are not to be taken as implying that the modern State is the immediate successor of the ancient city; there were, of course, numerous intermediary and transitional stages.

child he finds his education provided for by the State ; when he enters the factory he finds a complicated system of laws destined to regulate his daily activity, to protect him against undue exploitation, to help him in times of distress, to assure him of an enduring old age. The majority of individuals, during their entire life, are thus constantly reminded of the fact that they are citizens of a State whose interests are also their interests.

But in spite of the ever greater intervention of the State in the affairs of the individual, the effectiveness of this intervention still remains greatly inadequate to the needs of society. The more the State endeavours to envelop the individual life, the less capable does it appear of realising its object of a stronger integration of social life. The reason need not be sought for in the vastness of the State. If the State be incapable of giving to the individual life that stable moral basis indispensable to it, it is not because the State is an organisation too *vast* to be able to touch the individual directly. The Church is a vaster organisation than the State ; and yet the Church is able to dominate the believer's life in a far greater measure than the State is able to dominate the citizen's. The reason for the inadequacy of the State to meet the needs of the individual is to be sought in the absence of any principle capable of touching the individual directly enough to reform his moral nature. The doctrine of State intervention does not contain any vivifying principle powerful enough to limit the desires of the psychological life. State intervention, when pushed to an excessive degree, tends to favour the development of class egoism ; excessive political centralisation in a State whose polity is based exclusively on economic antagonisms cannot fail to have as a consequence the deplorable spectacle of the dominant party in the State employing the organisation and resources of the State for the furtherance of its own party interests, to the detriment of other social categories. The extreme degree of egoism which can be engendered by the consciousness of the power which the control

of the State gives to the governing class is manifested by the Socialist party, the object of which is to bring about, through the medium of the State, a dictatorship of the proletariat. The proletariat, having obtained a majority at the polls, are to employ the vast power which the centralisation of State business confers on the Government to alter the structure of society in accordance with the narrowest class interests. Thus State intervention, far from limiting the desires of the individual, tends to excite these desires and to stimulate them ; for the hope is always left to the individual that what he cannot achieve himself will be achieved for him by the State.

On the one hand, therefore, the sphere of State control is continually extending, and tending to envelop a greater number of activities appertaining to the domain of individual life ; on the other hand, the very nature of the State excludes the possibility of a moral principle adequate to the needs of the individual conscience. The State, in taking upon itself the performance of functions to which it is ill adapted, or not adapted at all, restricts the activity of other social organs, and endeavours to monopolise all the sources from which the satisfaction of the multitude of human wants is derived. But, as is always the case with hypertrophied organs, the State, thus abnormally extended, cannot even fulfil the normal functions which are its *raison d'être*, and the performance of which constitutes its justification. Thus we may say that, as fast as the State undertakes the accomplishment of tasks to which its nature is not adapted, its capacity for accomplishing the primary ends of government is weakened and diminished.

One great danger which an exaggerated policy of State intervention brings with it lies in the atrophy and eventual extinction with which those organs of social existence are menaced which, by their very constitution, are destined to act as powerful factors of social solidarity. Within the State, and also above the State, are other factors which social evolution has brought

into play—social organs in the fullest sense of the word, capable of enveloping the individual life and influencing the individual conscience in a manner in which the State could never hope to affect them. These organs are capable of knitting the individual molecules of society into a compact and united whole ; capable of inspiring each individual with the consciousness of his duties towards the society of which he is a unit ; capable, by holding out to the individual an ideal powerful enough to rule the individual's conduct, and yet never completely realisable, of giving greater value to life ; capable, above all, of checking individual desires, and thus effectually putting an end to that dangerous condition of moral instability known as insatiability. The extension of the influence of such organs must be sincerely desired by all. But the tendency of the State to transform itself into the sole organ of social control, to undertake the performance of functions of a moral nature for which it is utterly incompetent, seriously endangers the continued existence of these other indispensable organs of society. Their absorption by the State would be a double disaster, in that, while such an absorption would destroy an essential principle of social integration, it would likewise render the State less fit to discharge those primary duties for the fulfilment of which it exists.

The increase in the suicide-rate of Europe being due to the amorality which characterises social life, and this amorality being but the result of an excessive individualism, it is necessary that we should seek to re-establish a principle which, while it ensures the liberty necessary for the evolution and expansion of the personality of each individual, nevertheless subordinates the judgment of the individual conscience to the judgment of society. It is not blind obedience which we would recommend, and, indeed, the time for blind obedience has passed ; the first task of every essentially social principle must be to convince the individual of his solidarity with the society of which he is

a unit, and of the necessity of his subordinating his individuality to the higher interests of that society. We have seen the beneficial influence of domestic integration on social life ; but domestic integration, and the procreation of offspring, are results in their turn of a principle more fundamental still. There is no reason why men should prefer an orderly married life and the procreation of offspring, with all the responsibilities which family life brings with it, to concubinage and the non-procreation of offspring, unless they are actuated by some moral principle to which their individual desires consciously subordinate themselves. We must seek the origin of domestic institutions in the more or less vague consciousness of their utility to society. In early ages the individual was so dominated by the tribe of which he was a member that the *telos* of the tribe was also the *telos* of the individual, and *vice versa*. The stability of domestic life was slowly brought about by the combined influence of two factors—the complete subordination of the interests of the individual to the interests of the tribe, and the growing consciousness of the necessity of stable domestic life for the prosperity of the tribe ; a consciousness which from the first must have tended to develop and propagate itself as an effect of selection by the sole survival of the tribes possessing stable domestic institutions. However, in proportion as the primitive social aggregate, the tribe, became extended and enlarged, its influence over the individual diminished. It has receded farther and farther from the individual, and the original identity between the interests of the two has been obliterated. As the influence of the tribe was no longer sufficient, it became indispensable for society to find another principle capable of dominating the individual ; otherwise the stability of domestic life must necessarily have been undermined. The recognition by the Christian Church of the sacramental and indissoluble character of marriage shows, once more, the profound knowledge of the needs of society always possessed by the Church ; the dogmas of the ecclesiastical

organisation, coupled with the powerful ascendancy of the latter, preserved the stability of domestic institutions in Europe throughout the vicissitudes of fifteen centuries.¹

The ecclesiastical organisation, as we have said, is to-day much weakened. Can we hope to revive its force, to regenerate social life through the influence of the Church? This question is a difficult one to answer, and it is not here the place to discuss it. A volume in itself would have to be written were the subject to be treated in detail; and the sociologist would run the risk of confounding his purely personal views with the realities of the situation, and of interpreting social evolution from a subjective instead of from an entirely objective standpoint. Another solution may perhaps be found in the reorganisation of those ties of professional solidarity which characterised so markedly the economic life of the Middle Ages, and which the development of capitalist production has destroyed. But here, again, we should have to examine closely the structure and functions of the guilds and corporations of former times, and see whether the establishment of bodies, not identical, of course, but modified so as to adapt them to the necessities of modern life, is a possibility with which the sociologist can reckon. One general conclusion can, however, be drawn from this consideration of suicide as a social factor: the urgent necessity for the re-establishment of a principle capable of ensuring adequate social integration. From this conclusion we may draw the corollary that individualism is the great danger confronting us at the present time. Once we are assured of this fact, the remedy can be found, if only we set resolutely to work to find it.

¹ The study of suicide as a social factor is so important, that the question can only be touched upon in its broad outlines in the present book. We would refer the reader to Professor Durkheim's work (pp. 289-311), and to an article contributed by us to the *Revue de Philosophie* (February, 1907) for details concerning the influence of divorce on suicide. It will be seen that the study of suicide as a social factor leads to unexpectedly fruitful results, and throws a vivid light on the nature of so fundamental an institution as marriage.

APPENDIX I

It may be objected that suicide, even if it be not the act of an insane mind, is nevertheless the expression of a weak and neuropathic temperament, and that consequently the self-destruction of these individuals is beneficial to society, in that it eliminates weak and worthless elements. To this we would reply: (1) The assumption that neurasthenia is synonymous with degeneracy, so that we may identify all the neuropathic units in society with the *worthless* elements, is entirely arbitrary. Neurasthenia is to-day a very common complaint, and its spread is due almost exclusively to the intensity of the struggle for existence, to the *Hasten, Drängen, und Jagen* brought about by the evolution of the capitalist system of production. Most persons are affected in a greater or lesser degree by neurasthenia, which is decidedly, as the French say, the *mal du siècle*. Are we, then, to say that all those affected by neurasthenia are worthless elements of society? Such a generalisation appears the more unjustified when we remember the connection between neurasthenia and genius. Mahomet was certainly a neuropathic person, and it is highly probable that he suffered from epilepsy. Napoleon was certainly a sufferer from a disordered nervous system; and how many others could be named, whose fame has penetrated to the four ends of Europe, and who were sufferers from hereditary neurasthenia? And yet one can hardly maintain that Mahomet, the founder of a religion which, with Buddhism and Christianity, counts the greatest number of adherents to-day, was a worthless member of society, or that the world would not be the poorer if Mahomet had never existed. Would not society be the poorer if the genius of Napoleon had not shown humanity what human force can achieve, to what heights of glory man can raise himself? Supposing the persons who commit suicide to be of neuropathic temperament, does it follow that their loss is of no account to society? If they are failures, cannot their failure be attributable to circumstances external to their personality? The financier who kills himself as the result of unfortunate speculation may be a man of genius, and his failure may be due to the combination of hostile forces; and the suicides attributable in the first instance to speculation, are most certainly attributable, in the last instance, to an economic system which engenders an unhealthy love of money for its own sake; and which glorifies the material gain at the expense of the spiritual. The part played by economic conditions in determining the rate of suicide is a most important one; not only the suicide of financiers, but the great majority of all suicides, can be traced, in the last resort, to the amorality produced by the too exclusive supremacy of the economic factor in our Western society to-day. (2) That neurasthenia implies that those who suffer from it are degenerate, consequently inferior, members of society—the word “degenerate” must here be taken in its usual sense, the individuals whom Professor Magnan has characterised as *dégénérés supérieurs* being frequently among the most valuable assets of humanity—is sufficiently refuted by the figures we have given concerning suicide in the religious communities, concerning the influence of domestic life on suicide, and concerning the influence of political crises on suicide. Can it

be maintained that there are more degenerate persons in the Protestant Churches than in the Catholic Church ? Or that Protestant countries are more subject to degeneracy than Catholic countries ? Or that Eastern Europe, where the rate of suicide is particularly low, is composed of a population superior to the populations of Western Europe ? Those who insist on the connection between suicide and degeneracy must either deny the figures we have given, and will give further on, or admit that degeneracy is a characteristic of Protestant countries ; and how, then, explain the low suicide-rate in England and Wales, which are essentially Protestant countries ? How comes it, from this point of view, that Protestant populations on the Continent should be degenerate, and that the Protestant population of England and Wales should not be degenerate ? Obviously, another factor must come into play, and the insufficiency of the theory of degeneracy must be recognised. Can it be maintained that bachelors of sixty are more degenerate than bachelors of forty-two ? But degeneracy is not acquired in the latter half of life ; if the organism is not degenerate at forty-two, it is unlikely to become degenerate within the next twenty years. Degeneracy is almost always the result of heredity, and manifests itself with equal force at all ages, but particularly during youth. Are married men without children more degenerate, as a whole, than those with children ? Degeneracy does not engender impotence, except when its extreme stages are reached ; but between idiocy and simple neurasthenia there is a wide gulf : the difference is not merely quantitative, but qualitative, and manifests itself anatomically in an alteration of the cerebral structure. Can it be maintained, finally, that years of political crisis are less favourable to the development of degeneracy ? There is *a priori* no reason for this assumption. It if be said that the diminution of the suicide-rate is due to the fact that a number of degenerate persons who would otherwise commit suicide are prevented from so doing by being sent to do battle for their country, and that the rise in the suicide-rate after the war is over is attributable to the fact that these persons, once more liberated, go to swell the number of those who would, in any case, make up the social rate of suicide ; we may reply that this argument is susceptible of more refutations than one. Firstly, it would apply only to years of actual war. But how explain the slight fall in the suicide-rate in France in 1867, or the much greater fall in 1869 ? These were not years of war ; consequently, the degenerate persons who would otherwise have killed themselves were not prevented from doing so by war. And here we come back to the question, What prevented them from following the impulse of their degenerate temperament ? How explain the rise in the suicide-rate in England and Wales in 1868 and the years following ? There had been no war previously ; consequently no war could have engendered a crop of "reservists" to swell the usual number of suicides. Secondly, how does this view concur with the facts ? Supposing that those who commit suicide are degenerates, how comes it that they are recruited in considerable numbers ? We may take it that degeneracy eliminates from active service those who suffer from it ; and that, even in times of war, the number of degenerate persons who remain behind, and who are consequently at liberty to kill themselves, is practically the same as in times of peace.

APPENDIX II

FURTHER FIGURES RELATING TO THE RATE OF SUICIDE IN DIFFERENT RELIGIOUS CONFESSIONS. *Bavarian Provinces.*

Provinces with a Minority of Catholics (Less than 50 per Cent.)	Suicides per 1,000,000 of Total Population.	Provinces with 50 to 80 per Cent. of Catholics.	Suicides per 1,000,000 of Total Population.	Provinces with more than 80 per Cent. of Catholics.	Suicides per 1,000,000 of Total Population.
Rhine Palatinate ..	167	Lower Franconia ..	157	Upper Palatinate ..	64
Central Franconia ..	207	Swabia	118	Upper Bavaria ..	114
Upper Franconia ..	204			Lower Bavaria ..	49
Average	192	Average	135	Average	75

Switzerland.

French Cantons.	German Cantons.	All Cantons of all Nationalities.
Catholic { 83 suicides per 1,000,000 of total population.	Catholic { 87 suicides per 1,000,000 of total population.	Catholic { 86.7 suicides per 1,000,000 of total population.
Protestant { 453 suicides per 1,000,000 of total population.	Protestant { 293 suicides per 1,000,000 of total population.	Mixed cantons, in which the confessions are more or less equally divided } 212 suicides per 1,000,000.
		Protestant { 326.3 suicides per 1,000,000.

Statistics are lacking in respect of France. The only figures we know fully bear out our conclusions. Leroy, in an essay on the department of Seine-and-Marne, published thirty-six years ago, came to the following result: In the three towns of Quincy, Nanteuil-les-Meaux, Mareuil, the rate of suicide among Protestants was 1 per 310 of the total number of inhabitants, that among Catholics 1 per 678. (*Leroy, Étude sur le Suicide et les Maladies mentales dans le Département de Seine-et-Marne*, p. 203 ; Paris, 1870).

APPENDIX III

INFLUENCE OF SEASONS ON SUICIDE.¹

Month.	France (1866-70).	Italy (1883-88).	Prussia (1876-78, 1880-82, 1885-89).
	Monthly Repartition of 1,001 Annual Suicides (Average Numbers).	Monthly Repartition of 998 Annual Suicides (Average Numbers).	Monthly Repartition of 995 Annual Suicides (Average Numbers).
January	68	69	61
February	80	80	67
March	86	81	78
April	102	98	99
May	105	103	104
June	107	105	105
July	100	102	99
August	82	93	90
September	74	73	83
October	70	65	78
November	66	63	70
December	61	61	61
Total	1,001	993	995

The average number of annual suicides for the three countries under consideration, taken together, is 996·3. The average number of suicides occurring in June (for all three countries together) is 105·6. The average number occurring in May is 104, and the average number occurring in December is but 61.

There is, in all three countries, a steady progression from January till June, and an equally steady falling off from July to December. It may be said that these variations in the suicide-rate are due to the variations in the temperature, and that the latter are the cause of the former. And, indeed, some writers, notably Professor Ferri, have endeavoured to trace a connection between thermal variations and variations in the rate of homicide and suicide. With variations in the rate of homicide we are not here concerned, but we may say that homicide is not by any means a phenomenon similar to suicide. Neither the causes which produce homicidal tendencies, nor the homicidal tendency itself, can be assimilated to the tendency to commit suicide. The homicidal tendency is far more intimately bound up with heredity and with other causes of a biological nature, and thermal variations, acting on the peculiar physiological and psychological constitution of the criminal, do undoubtedly bring about an increased tendency to commit homicidal acts under the influence of heat. The tendency to commit suicide, however, is not thus directly connected with thermal variations, as will be seen in the next chapter. A good proof of the fact that an increase of heat does not produce an increase of suicide *by itself and without co-operation of other factors* is furnished by the above figures. The average June temperature in Italy is 21° C. That of July is 24° C., and yet the average number of suicides in July is *less* than the average number in June. Similarly, although the mean temperature of Italy is considerably higher than that of Prussia or France, the average number of suicides is about the same. The rise in the suicide-rate proceeds *pari passu* with the growth of economic activity, which is naturally greatest when the days are longest (see pp. 279-287).

¹ E. Durkheim, *Le Suicide*, p. 93.

CHAPTER II

INSANITY AS A SOCIAL FACTOR

I.

HAVING considered suicide as a factor in social pathology, as a socio-pathogenic phenomenon, we will turn our attention to another phenomenon which is not of less sociological importance. Even as the increase in the rate of suicide must be considered a pathological symptom of our social life, so must also the increase of insanity. For mental disease is undoubtedly increasing, and its increase is one of the most alarming phenomena with which sociology has to deal to-day. The increase of mental disease implies a biological deterioration of the race; for its increase is excessive in comparison with the rate of increase in the population as a whole.

It is well known that movement implies expenditure of energy; and the greater the intensity of the movement, the greater will be the expenditure. The organism can live only at the expense of its reserves; the muscle can enter into activity, for instance, only at the expense of the glycogenous substance which constitutes the reserve of the muscle. And it may be urged that it is the same with the social organism; the latter can exercise its activity only at the expense of the individuals which compose it, and which constitute the social reserve; just as the biological organism can exercise its activity only at the expense of the proteids, carbohydrates, and fats which it absorbs. This general law—that all movement implies expenditure of

APPENDIX III

INFLUENCE OF SEASONS ON SUICIDE¹

Month.	France (1866-70).	Italy (1883-88).	Prussia (1876-78, 1890-92, 1885-89).
	Monthly Repartition of 1,001 Annual Suicides (Average Numbers).	Monthly Repartition of 998 Annual Suicides (Average Numbers).	Monthly Repartition of 995 Annual Suicides (Average Numbers).
January	68	69	61
February	80	80	67
March	86	81	78
April	102	98	99
May	105	103	104
June	107	105	105
July	100	102	99
August	82	93	90
September	74	73	83
October	70	65	78
November	66	63	70
December	61	61	61
Total	1,001	993	995

The average number of annual suicides for the three countries under consideration, taken together, is 996·3. The average number of suicides occurring in June (for all three countries together) is 105·6. The average number occurring in May is 104, and the average number occurring in December is but 61.

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It is well known that movement implies expenditure of energy; and the greater the intensity of the movement, the greater will be the expenditure. The organism can live only at the expense of its reserves; the muscle can enter into activity, for instance, only at the expense of the glycogenous substance which constitutes the reserve of the muscle. And it may be urged that it is the same with the social organism; the latter can exercise its activity only at the expense of the individuals which compose it, and which constitute the social reserve; just as the biological organism can exercise its activity only at the expense of the proteids, carbohydrates, and fats which it absorbs. This general law—that all movement implies expenditure of

energy, that is to say, loss—is incontestable ; and its corollary, that the movement of the social organism—in a word, social evolution—cannot occur without the destruction of life, is equally obvious. But to deduce from this law, prevailing in both the inorganic and the organic world, that all loss occasioned in the social organism by the prevailing social conditions is necessary loss ; to argue from this basis that there is no wastage of social force, and consequently no weakening of the social organism, nor incoherence of social life ; is equivalent to contending that organic pathology does not imply a wastage of vital energies, because all organic life implies expenditure, and therefore loss of something.

Whenever movement takes place within the organism, when the muscle contracts, when the will manifests itself, when thought is active, when the gland secretes, the substance of the muscle, nerves, brain, and glandular tissue is disorganised and consumed ; every phenomenon in the life of an organism is necessarily bound up with organic destruction. All nourishment, in a normal organism, undergoes digestion and absorption by the tissues ; this digestion consists in a *simplification* of the chemical substance introduced as nourishment ; and this simplification implies the liberation of the surplus quantity of energy contained in the nutritive matter before its introduction into the organism, when it existed in a more complex condition. The energy thus liberated by the act of digestion becomes the source of the vital energy of the organism ; whereas the digested substance is finally incorporated into the living tissue, where it exists as a *reserve substance* of that tissue. Whenever a tissue enters into activity, a disassimilation of its reserve substance takes place. Activity and destruction of tissue, elementary life and elementary death, are thus correlated phenomena, which imply each other.

The organism makes good the functional destruction of its reserves by nourishment, by borrowing from its environment

the material with which it replaces its depleted stock. The "ingesta" of the organism balance its "excreta." Albumin, sugar, fat, oxygen, balance quantitatively the water, carbonic acid, and urea which are their waste matters. The energy manifested by the organism in all vital phenomena—which has its source, as we have seen, in the chemical energy derived from the nutritive substance—may be measured as a quantity of heat. That is to say, the vital energy brought into action is restored to the outer world as heat; which amounts to saying that the chemical phenomenon is the *source* of all vital energy, and the thermal phenomenon its resultant. Thus, the chemical energy which the nutritive substance is capable of imparting to the organism constitutes the alimentary potentiality of that substance, its dynamic value. And this dynamic value is also its vital value; for, as we have seen, the chemical energy liberated by the digestion of the nutritive substance is destined to manifest itself in the physiological activities of the organism.¹

Organic life is thus impossible without expenditure; that expenditure is expressed by the quantity of physiological work that can be performed under given circumstances; and the health of the organism depends upon its physiological work corresponding to the chemical energy derived from its food—in a word, on its activity being normal. A diet which is defective will possess a correspondingly reduced vital value—that is to say, the physiological activity will be correspondingly reduced. But, on the other hand, a diet which is excessive will be equally harmful, for it will provoke a hyperactivity of the functional system which is altogether out of proportion to the potential strength of the organism; for every organism can but perform the work for which it is naturally fitted. Thus

¹ The formation of new protoplasm requires a considerable amount of energy, for the chemical composition of protoplasm is very elaborate. It is probable that the energy liberated by the digestion of the nutritive substance supplies the needs of the organism in this respect.

we may say that the organism is the seat of chemical reactions of two sorts, the one destructive, the other synthetic and constructive. The sum of these reactions constitute the phenomena of nutrition. Life is a succession of phenomena of assimilation and disassimilation, of construction and disruption, of anabolism and katabolism.

In the biological as in the social organism, excessive katabolism or disassimilation implies reduction of the vital power. There is no longer correspondence between the potential strength of the organism and its physiological activity; and physiological activity carried to excess is pathological. All social life implies loss. Death is, as we have seen, an institution which exists for the benefit of the species; or, at least, for those species which have passed the unicellular stage of organisation. And death is an institution which is indispensable for the continuance of social life. In the struggle for existence between societies, and in the struggle between individuals belonging to the same society, the feebler must be exterminated. The law of selection is a beneficial one; it is a law which, if allowed to operate normally and without restriction, has as its result the constant improvement of organic life. We saw, in the first part of this work, that Nature requires an immense number of forms, a vast wealth of organic life, in order that selection may have free play. We saw that all the apparently reckless extravagance of Nature in this respect is justified by the aim which is implied in the whole organic process—the conservation of the species. And it must be evident to anyone at all familiar with biological phenomena that the conservation and ultimate perfecting of a species can only be secured at the price of a tremendous sacrifice of individual life.

But the very fact that the conservation of the species is its *raison d'être* in itself justifies this sacrifice of individual life; for, as a general law, those individuals who are sacrificed are precisely those who are of least use to the species, the weak,

the slow, the sickly, the defenceless. And it is necessary, it is indispensable to the species, that these useless members should be eliminated; for otherwise, and by virtue of the law of panmixia, organic deterioration of the whole species would set in, and its extermination would be the ultimate result.

Thus, the law of selection is not only beneficial, it is indispensable for the conservation of the species. In human societies, to as great an extent as in animal societies, this law of selection prevails. It may therefore be urged that those phenomena which we consider as pathological elements in social life are merely normal features, due to the rapidity of social evolution, and determined by the law of selection. But this contention is rendered untenable by a single consideration. Selection, operating within a species living under natural conditions, causes the extinction of weak and diseased members of the species, and the survival of the better adapted members. But in civilised society to-day precisely the contrary is the case. Granted that only the morbidly predisposed fall victims to mental disease, and that, in this way, a diseased element is removed from social life—a contention which, however, is not by any means universally valid—the fact remains that mental disease is continually increasing, both absolutely and relatively. Consequently, a diseased element is ever increasing, and increasing at the expense of the non-diseased elements; and therefore a biological deterioration is in progress. Here we have the diametrical converse of what ought to happen were selection permitted to operate normally, by the extinction of the unfit and the multiplication of the fit. It is the unfit who are being multiplied—a result contrary to the basal principle of the law of selection, and equally contrary to the fundamental interests of the species—in this case, human society.

We are thus justified in seeing in this increase of mental disease a phenomenon of social pathology. It is not a case of

the "elimination of the waste matters of the social organism"; for precisely these elements, morbid in the extreme, are *not* eliminated as they should be, but are retained and allowed to multiply. The diseased member is not removed from active social life, but is permitted to mix freely with it, contaminating those who are not diseased. In civilised States, owing to the changed conditions brought about by social evolution, the survival of the individual no longer depends on the perfection of his vision, as did that of the members of the primeval tribes seeking their prey in the forests. Individuals, therefore, in whom the faculty of vision is less well developed—such as the short-sighted—are allowed to survive and multiply on equal terms with those in whom it is more highly developed. When this is the case, a progressive deterioration of the faculty of vision in the whole race must set in, in accordance with the law of panmixia. This law may be defined as the equalisation of conditions for the more evolved and the less evolved. The consequence is obvious: when the more evolved have no advantage, and when the less evolved are able to survive and multiply as freely as they, then the standard of development attained by the more highly evolved—which, under natural conditions, is necessarily attained by all the survivors of the species—must inevitably be lowered. It will no longer be common to the species as a whole; those individuals who possess it will not be selected; and, finally, it will become a rarity. No doubt exists as to the deterioration of the visual faculty under the artificial conditions created by social evolution. There is probably not a species among vertebrates whose visual faculty is not infinitely greater than that of civilised man.

It is the same with any faculty. If a faculty is to be maintained at a certain degree of development, all those individuals possessing a regressive variation of it must be rigidly exterminated before attaining maturity. For it is obviously useless to exterminate such individuals if we permit them first of all to

reproduce. If the general physiological condition of mankind is to be maintained at its highest possible degree of development, individuals who fall below this level must disappear. But this is by no means the case. Individuals presenting all the stigmata of degeneracy are allowed to survive and multiply on equal terms with those who do not present these stigmata. Degenerate individuals, in a word, are *not* eliminated, and superior individuals are *not* selected. The result we see to be an alarming increase of physical and mental degeneracy.

If we grant that suicide is a pathological feature of social life, an aberration from the normal type, we must admit at the same time that the causes which produce it are pathogenic in their nature. Were the number of suicides always the same from year to year, we might certainly regard this phenomenon as socially necessary, if not normal; for we might very well consider it as a simple elimination of the waste matters of the social organism. But when the suicide-rate is constantly on the increase, an increase which is disproportionate to that of the population during a given period, we are obliged to regard it as a pathological phenomenon. Suicide, being more exclusively social in its causes than mental disease, cannot be explained, as far as its great increase is concerned, by the multiplication of individuals inclined to suicide; for, in the first place, this hereditary suicidal mania is far from being proven; and, in the second place, suicide is not necessarily connected with the increase of any clinical form of mental disease, so that we cannot speak of the multiplication of "suicidists" as we do of the multiplication of persons afflicted with epilepsy or with general progressive paralysis.

But although the law of panmixia, which implies the equalisation of conditions for the survival and reproduction of persons inclined to suicide and persons not so inclined, cannot be used to explain the increase of the suicide-rate, yet this increase is none the less pathological; for it shows that the pathogenic

conditions in social life which determine these morbid phenomena are increasing in intensity. And if the conditions which affect more particularly the social organism as a whole are unhealthy, the result brought about is the same as if the more particularly individual conditions are unhealthy. An increase in the intensity of the pathogenic social factors which determine the increase of the suicide-rate is as harmful for the life of society as an increase in the number of individuals tainted by some specific hereditary mental disease.

We speak of mental disease as if it were mainly a phenomenon of individual pathology. And, as a matter of fact, we have the authority of Dr. Paul Sollier, the eminent French psychiatrist, for affirming that individual predisposition is, indeed, the main factor in this disease. But even if mental disease were exclusively a phenomenon of individual pathology, the multiplication of diseased individuals and the social danger which results from such multiplication would in themselves justify our considering this disease under the heading of social pathology. Dr. Sollier, however, has himself expressed to us his belief that alcoholism and syphilis may be regarded as the chief agents in the increase of insanity; and this conclusion will be amply confirmed by our statistics. But alcoholism and syphilis are undoubtedly to a certain extent social phenomena; it is not only the medical man who has to examine alcoholism and syphilis in their clinical aspects—the sociologist has also to interest himself in these diseases, since they constitute a menace to the stability of social life.

To sum up: Although the individual factor is more important in mental disease than it is in suicide, yet, in considering the statistics of mental disease as we have considered those of suicide, we find the social factor entering upon the scene as a determining pathogenic factor of both. If the intensity of economic life and the philosophic nihilism of the present day are chiefly responsible for the augmentation of the suicide-rate; alcoholism and, in a lesser degree, syphilis are chiefly responsible

for the augmentation of the rate of insanity. The individual factor comes more into evidence in mental disease, because we are here dealing with clinical forms of disease, each with its recognised and differentiated symptomatology; whereas the phenomenon of suicide does not appear to be bound up with any distinct form of nervous disease, but to rest only on an indistinct general background of degeneracy. The clinician called upon to examine an individual case of suicide or mental disease will endeavour to lay bare the individual aspects of the particular case. The rôle of the sociologist is, not to examine the individual suicide or the individual maniac, but to collect the evidence afforded him by clinical research in order to arrive at a diagnosis of both phenomena considered in the aggregate as social phenomena. When we come to consider the suicide-rate, or the rate of mental disease in general, we shall find both suicide and insanity to be determined, *in their general aspect*, by laws outside of the biological individual and belonging to the domain of sociology proper.

II.

That the rate of mental disease is increasing, and increasing fast, is proved by the statistics of all European countries, and is universally admitted. As Oettingen remarks: "The relative increase in the number of mentally diseased persons is, especially in the most recent times, so constant and so extraordinarily great in every country which has been brought under observation, that a real increase of the malady can be as little doubtful as the increase of the suicide-rate."¹ And Dr. Paul Garnier, the distinguished chief of the infirmary of the Prefecture of Police in Paris, who was prematurely carried off by death in 1905, and

¹ Oettingen, *Moralstatistik*, p. 671. Erlangen, 3rd edition, 1882.

from whom we draw our statistics, likewise concludes that, especially in cities and towns, "mental disease increases in an alarming manner. Many causes contribute to this, principally alcoholism, which is ever on the increase ; and also that functional hyperactivity, that intellectual and physical excess, that exaggerated tension of all the vital forces, which are called forth by the keenness of the struggle for existence."¹ Not to multiply quotations, we shall only further cite Professor Fircks, who, writing in 1898, remarks that "the increase in the number of mentally diseased persons must be admitted as a fact which is well proved."²

Coming now to the statistics of mental disease, we find figures given in Table A concerning the number of persons declared of unsound mind at the infirmary of the Prefecture of Police in Paris during the triennial period 1886-89.

It will be remarked that we choose our statistics from Paris. And, in truth, no city could be better calculated to give us an idea of the results produced by the hyperactivity of our modern civilisation in their pathological aspects. The statistics of Paris may be held to be applicable in their results to all the other great cities of civilisation. In the statistics before us we find the number of persons admitted as insane to the infirmary of the Prefecture to have risen from 2,597 in 1886 to 2,859 in 1888, an increase of nearly 100 per annum. We find here the number of women lower than that of men, and this may seem to be in contradiction with previous statistics given in the last chapter. But, as a matter of fact, we must remember that the inmates of the infirmary of the Prefecture are mostly insane persons who have committed some crime ; for this reason alone we must expect to find the rate of men inmates greater than that of women.

¹ P. Garnier, *La Folie à Paris*, p. 4. Paris : J. B. Baillière, 1890.

² A. Fircks, *Bevölkerungslehre und Bevölkerungspolitik*, p. 16. Leipzig, 1898.

TABLE A.—STATISTICS OF PERSONS ADMITTED AS INSANE TO THE INFIRMARY OF THE PREFECTURE OF POLICE IN PARIS, 1886–89.

Year.				Men.	Women.	Total.
1886	..	..	..	1,514	1,083	2,597
1887	..	..	..	1,587	1,096	2,683
1888	..	..	..	1,730	1,129	2,859
Total	..	..	..	4,831	3,308	8,139

If we examine the progress of insanity in the department of the Seine during seventeen years, from 1872–88, according to the statistics furnished by the Prefecture, we come to the results given in Table B.

TABLE B.—STATISTICS OF INSANITY IN THE SEINE DEPARTMENT, 1872–88.

Year.	Men.	Women.	Total.
1872	1,695	1,389	3,084
1873	1,841	1,408	3,249
1874	1,743	1,510	3,253
1875	1,770	1,400	3,170
1876	1,782	1,448	3,230
1877	1,776	1,565	3,341
1878	1,829	1,507	3,336
1879	1,902	1,489	3,391
1880	1,932	1,552	3,484
1881	2,097	1,641	3,738
1882	2,093	1,623	3,716
1883	2,208	1,755	3,963
1884	2,313	1,813	4,126
1885	2,289	1,897	4,186
1886	2,486	1,981	4,467
1887	2,497	1,892	4,389
1888	2,549	1,900	4,449

During the period 1872–88 the number of insane persons in the most important and populous department of France, according to the returns given by the Prefecture, has risen from 3,084 to 4,449, or more than 44 per cent. The number of men regis-

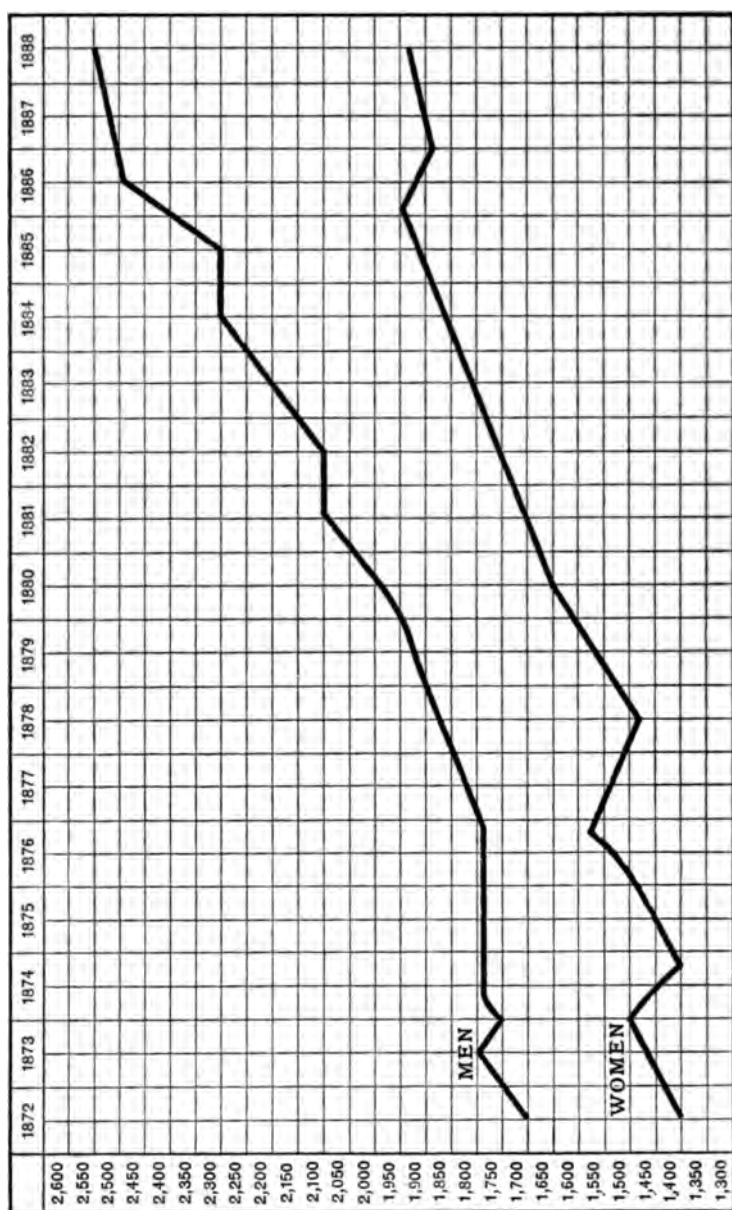


DIAGRAM SHOWING PROGRESS OF THE RATE OF INSANITY IN THE DEPARTMENT OF THE SEINE, 1872-88
(AFTER GARNIER).

and as insane has increased from 1,695 to 2,549, the number of men from 1,389 to 1,900. The diagram on the opposite page was more clearly than any figures the constancy of this increase in the rate of insanity. If we consider only short periods, increase does not manifest itself so clearly; but when we consider the whole of this period of seventeen years—a very short epoch in the life of a nation—we observe the results in all their forcible eloquence. An increase of 45 per cent. in the insanity during seventeen years is indeed alarming.

Having noted this increase, let us observe some of its details. What are the forms of insanity which have been registered, and what share has each form in the increase of the whole? If we turn to Table A, giving the number of persons admitted to the primary of the Police Prefecture in Paris during the years 1866–88, we find 4,831 men and 3,308 women. Table C shows

TABLE C.—RELATIVE FREQUENCY OF THE DIFFERENT MORBID FORMS AMONG THE MEN.

Alcoholism	1,813 cases.
Mental degeneracy (idiocy, etc.)	821 "
Mental enfeeblement (softening of the brain, tumours, etc.)	548 "
General paralysis	710 "
Epilepsy	249 "
Mania	210 "
Melancholia	179 "
Senile dementia	150 "
Chronic delirium	105 "
Total	4,831 "

RELATIVE FREQUENCY OF THE DIFFERENT MORBID FORMS AMONG THE WOMEN.

Mental degeneracy (idiocy, etc.)	644 cases.
Melancholia	509 "
Mental enfeeblement (softening of the brain, tumours, etc.)	438 "
Alcoholism	376 "
Mania	321 "
General paralysis	288 "
Senile dementia	287 "
Chronic delirium	276 "
Epilepsy	169 "
Total	3,308 "

the proportion of the different forms of insanity among the two sexes.

Thus we find, among the men, that alcoholism occupies the first place by a very large majority—1,813 cases out of a total of 4,831, or about 38 per cent. Alcoholism, although it only occupies the fourth rank among the women, nevertheless counts 376 cases among the latter sex out of a total of 3,308, or about 11 per cent., which is a very considerable proportion for the female sex. The growth of alcoholic insanity is as constant as the growth of insanity in general. Table C shows us an aggregate of 1,813 cases of men and 376 cases of women during the three years 1886–88. The figures in Table D show us the proportion which each of these years contributes to this aggregate.

TABLE D.—GROWTH OF ALCOHOLIC INSANITY—STATISTICS OF THE INFIRMARY OF THE POLICE PREFECTURE IN PARIS.

Year.				Men.	Women.	Total.
1886	..	..	..	533	111	644
1887	..	..	..	584	122	706
1888	..	..	..	696	143	839
Total	..	..	..	1,813	376	2,189

Let us now consider a longer period—from 1874–88—grouping the years into periods of three. We shall see that each triennial period presents a regular increase in the number of persons who become insane from alcoholic excess. (See Table E, opposite.)

An examination of these figures shows us that the annual triennial average has increased from 367·83 for the period 1874–76 to 729·66 for the period 1886–88—an increase of nearly 100 per cent.; that is to say that the annual triennial average has all but doubled in the course of fifteen years. The diagram on p. 272 helps us still more vividly to understand the meaning of these figures. It shows us that, in spite of slight fluctuations which are inseparable from the evolution of any social phenomenon, the increase of alcoholic insanity during the period under

consideration has been truly alarming. Table E shows us that the increase in the annual triennial average holds good for both sexes; it is even more accentuated for the female sex than for the male sex, the former having increased its average from 52·66 to 125·33, and the latter from 314·66 to 604·33.

We are thus justified in concluding that the increase in the total rate of insanity is very largely due to the increase in the consumption of alcohol. M. Duprat, in a recent work on the

TABLE E.—GROWTH OF ALCOHOLIC INSANITY FROM 1874-88—STATISTICS OF THE INFIRMARY OF THE POLICE PREFECTURE IN PARIS.

Years divided into Triennial Periods.	Men.		Women.		Total.	
	Annual Number.	Annual Triennial Average.	Annual Number.	Annual Triennial Average.	Annual Number.	Annual Triennial Average.
First triennial period	{ 1874 288 1875 311 1876 335 }	314·66	{ 47 58 53 }	52·66	{ 345 369 388 }	367·83
Second triennial period	{ 1877 302 1878 319 1879 356 }		{ 60 59 71 }		{ 362 378 427 }	
Third triennial period	{ 1880 355 1881 401 1882 442 }		{ 47 64 55 }		{ 402 465 497 }	
Fourth triennial period	{ 1883 482 1884 444 1885 424 }	450·00	{ 66 77 76 }	73·00	{ 548 521 500 }	523·00
Fifth triennial period	{ 1886 533 1887 584 1888 696 }		{ 111 122 143 }		{ 644 706 838 }	
		604·33		125·33		729·66

social causes of insanity, has reached the same conclusion; and remarks that if the proportional number of insane persons varies slightly every year, this annual variation is due to the constant increase in the number of persons afflicted by alcoholic insanity and general progressive paralysis. At the other end of the scale the category of senile dementia remains practically identical from year to year.¹

¹ G. L. Duprat, *Les Causes Sociales de la Folie*, p. 49. Paris, Alcan, 1900.

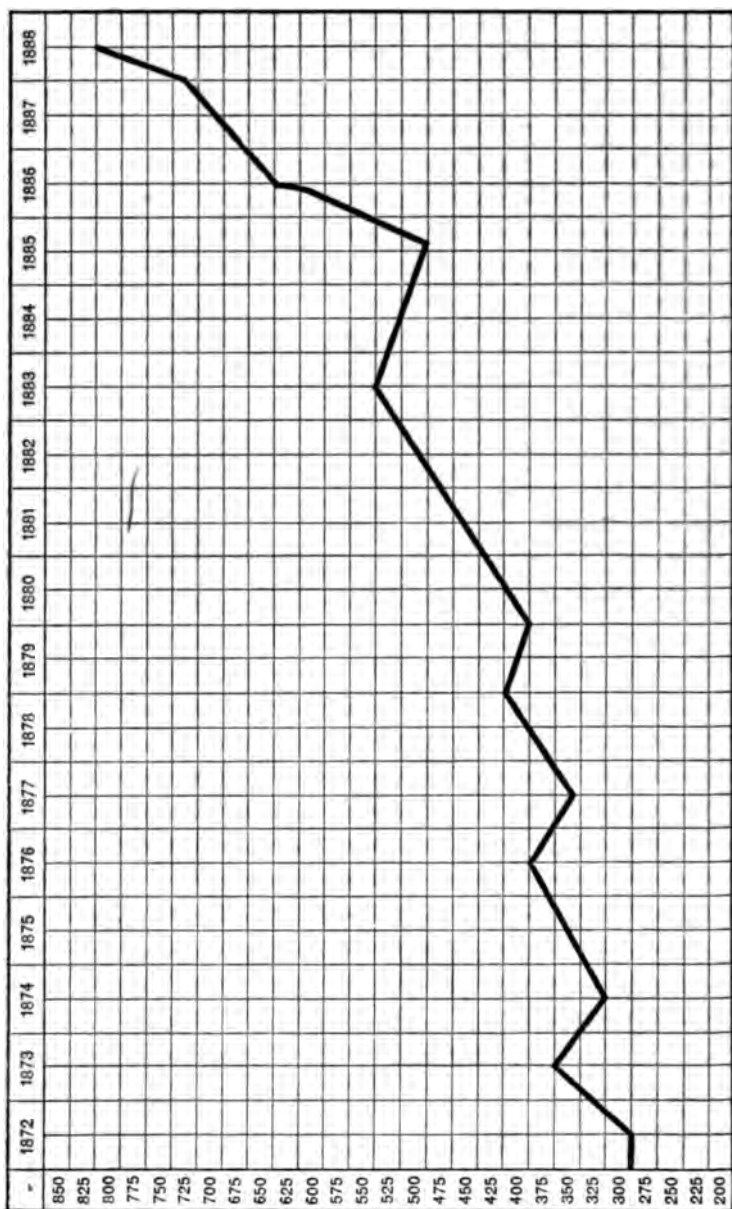


DIAGRAM SHOWING INCREASE OF ALCOHOLIC INSANITY, 1874-88 (AFTER GARNIER).

We have thus reached one of the two great causes of the increase of insanity—alcoholism. The second great cause, which we will now consider, is general progressive paralysis.

As to the symptomatology of this formidable malady the medical world has long been agreed; as to its etiology opinions are still divided. The majority of specialists hold general progressive paralysis to be invariably the result of syphilis, whether individual or hereditary.¹ But others, while admitting syphilis as an etiological factor in most cases, do not admit it in all. Where specialists differ, it is, of course, not open to a layman to give an opinion. On the one hand, it is a fact that even those who perhaps do not admit syphilis as a necessary etiological factor in general, nevertheless admit meeting with it in a great many cases. This fact might make it seem probable that syphilis is an agent in every case, and that failure to discover it is due to failure to search for it among the hereditary, as distinct from the individual, antecedents of the patient. On the other hand, syphilis by itself certainly does not suffice to produce general paralysis. It would appear to be established that only a dangerously neglected syphilis can result in general paralysis, or else syphilis combined with alcoholism or overwork, or both. Perhaps medical science will eventually arrive at the unanimous conclusion that these three factors—syphilis, alcoholism, and overstrain—each play a rôle in the determining of general paralysis.

However this may be, we are not here engaged in a clinical investigation into the etiology of general paralysis, but solely in a research as to the social effects of this formidable disease of the central nervous system. The increase of general paralysis is incontestable; and whatever may be the determining factors in the etiology of general paralysis itself, it is certain that general paralysis is one of the chief determining factors in the etiology

¹ Amongst others, Fournier, Raymond, Cornil, Brissaud, Neumann, Ripping, Erb, De Fleury.

of insanity. The following figures will permit of our judging of the constancy of its increase :

TABLE F.—INCREASE OF GENERAL PROGRESSIVE PARALYSIS—STATISTICS OF THE POLICE PREFECTURE IN PARIS.

Year.			Men.	Women.	Total.
1886	..	..	219	84	303
1887	..	..	241	101	342
1888	..	..	251	103	354
Total	..		711	288	999

If we take the fifteen years from 1874–88, and divide them up into triennial periods, as we did in the case of alcoholic insanity, we find that the annual triennial average of general paralysis has increased, according to the same statistics, from 187 for the triennial period 1874–76 to 333 for the triennial period 1886–88. The increase is observable in both sexes ; for the male sex the increase has been from 146·33 (annual triennial average for the period 1874–76) to 237 (annual triennial average for the period 1886–88). For the female sex the increase has been from 40·66 (annual triennial average for the period 1874–76) to 96 (annual triennial average for the period 1886–88). Thus the increase in the rate of paralytic insanity is as constant and as alarming as the increase in the rate of alcoholic insanity.

III.

If we turn now to the statistics of the consumption of alcohol in France, we find a constant augmentation of the rate of consumption per head of the population since 1850. The following return, showing the increase during each period of ten years, is instructive :¹

¹ *Revue de Statistique*, vol. viii., No. 35, p. 275. Paris, 1905.

Year.						Average Consumption per Head of the Population.
1850	..	..	..	..	..	1.46 litres.
1860	..	..	..	..	..	2.27 "
1870	..	..	..	..	..	2.32 "
1880	..	..	..	..	..	3.64 "
1889	..	..	..	..	..	4.00 "

If we take the civilised world in general into consideration, we find that the proportion of revenue derived from the taxation of alcoholic liquors is highest in Great Britain, where it attains to 32 per cent. of the revenue. The United States come second, with 28 per cent. The consumption of beer is greater in England than any other country of Europe, except Germany and Belgium. On the other hand, the consumption of wine is inconsiderable in England compared with the enormous consumption in France. Denmark holds the record for the consumption of alcohol, which attained to the proportion of 13.9 litres per head of the population in 1903. In England, in the same year, the average consumption of alcohol per head was 4.5 litres. According to the statistics furnished by Brock, the following is the rate of consumption of alcohol per head of the population in the principal countries of Europe during the period 1881-85 :¹

Country.						Consumption per Head (Pure Alcohol).
Italy	..	..	..	..	..	0.9 litres.
Norway	..	..	..	..	..	1.7 "
Great Britain and Ireland	..	..	..	..	..	2.7 "
Austria-Hungary	..	..	..	..	..	3.5 "
France	..	..	..	..	..	3.8 "
Sweden	..	..	..	..	..	3.9 "
Germany	..	..	..	..	..	4.1 "
Belgium	..	..	..	..	..	4.7 "
Denmark	..	..	..	..	..	8.9 "

If we compare these figures with those of 1903, the latest available, we find the consumption of pure alcohol to have

¹ O. J. Brock, *Les Excitants modernes*, in *Bulletin de l'Institut International de Statistique*, vol. ii., No. 1, pp. 326 ff. Rome, 1887.

increased all round.¹ Denmark, as already mentioned, once more heads the list, but with an average consumption per head of 13·9 litres instead of 8·9 litres. England, as we have likewise seen, attains an average consumption of 4·5 litres, as against 2·7 litres twenty years previously. That of Germany has risen from 4·1 litres to 7·9 litres; that of France from 3·8 litres to 7·1 litres; that of Sweden from 3·9 litres to 7·5 litres; and that of Belgium from 4·7 litres to 7·8 litres. In 1889, as we see from the first of the above statistical tables, the consumption in France was 4 litres per head of the population; fourteen years later it has nearly doubled.

Thus we see that the increase in the consumption of alcohol goes hand-in-hand with the increase of alcoholic insanity. The figures which we gave concerning the latter phenomenon are entirely in harmony with the figures concerning the former phenomenon. And we must inevitably come to the conclusion that, if the consumption of alcohol has thus increased during the last fourteen or fifteen years, the figures of alcoholic insanity must show a corresponding increase. When the cause increases so greatly in intensity, the effect must follow suit. Thus we may say that alcoholism, with its result, alcoholic insanity, is the greatest curse of modern civilisation.

But the statistics given above are instructive as throwing light on the conditions of social life at the present day. There is no phenomenon without a cause; and alcoholism is not a phenomenon produced by spontaneous generation, but has its causes—deep-seated causes, which have their root in the conditions of social life. It is a remarkable fact that the “balance of drunkenness,” so to speak, has shifted during the last century: formerly it was the fashion for the upper classes to cultivate inebriety; to-day alcoholism is predominant among the working classes. And even as the drink habit has been largely transferred from the aristocracy and country gentry to the working classes,

¹ *Revue de Statistique*, vol. viii., No. 40, p. 313.

so has the nature and form of drunkenness changed. Instead of the "boon companion" of former days who could drink astonishing quantities of Burgundy without affecting his health ; who, after a night's carousal, was brought home, slept soundly, and went about his usual business again the next day without feeling any effects beyond unusual heaviness ; who could continue thus for a lifetime, and yet remain—at all events, *apparently*—as sound in physique as a total abstainer—instead of this jovial drunkard of former days, we have to-day the alcoholised drunkard, the typical product of modified social conditions, tainted with the external stigmata of his vice, incapable of doing anything settled, going every year to swell the growing host of good-for-nothings and loafers, of criminals and the other waste products of society. This alteration in the symptomatology of the drunkard is incontestably due to a change in the nature of drink itself. Whereas formerly drink was relatively pure, to-day the drinks which are at the disposal of the working man are contaminated with every sort of poison. Thus absinth, for instance, owes its aroma largely to the mixing of the essence of numerous plants, such as mint, fennel, aniseed, angelica, organum, in the proportion of from 0.05 gramme to 0.1 gramme of the essence of absinth itself, and of 0.3 gramme to 0.8 gramme of the essence of the other plants, for two dessert-spoonfuls. When we bear in mind that 2 grammes of essence of absinth suffices to produce an epileptiform attack in the case of a dog, we can judge of the nervous disorders which must ensue in the case of a human being when he drinks absinth as a frequent or regular habit. But not absinth alone is thus toxic in its effects ; every spirituous drink is compounded of several alcoholic substances, such as ethylic, propylic, and amylic alcohols, all of which are toxic, but especially the latter.

We have said that the working classes are especially prone to alcoholism ; but the working classes have not the monopoly of it. If it affects the working classes in particular, alcoholism

affects in a lesser degree the other classes of society, and especially the business and intellectual classes. In the hurry and worry of everyday life which is a concomitant of the development of industry and commerce, many are the men who have recourse to artificial stimulants in order to brace themselves up for the struggle, whereas in the long run they are only saturating their nervous system with poison. It is not only in the production of what we have called alcoholic insanity that alcoholism is active : it is equally active in the production of that other pathological symptom *par excellence* of modern civilisation—general paralysis. Even if syphilis be admitted as the fundamental factor in the etiology of general paralysis, it is none the less certain that alcoholism is a determining factor at least as important. For syphilis, if it be properly treated, is absolutely curable ; but alcoholism, added to syphilis, is a most formidable foe. The business man or the intellectual man, having overstrained his nervous system by too much work, instead of having recourse to food and rest, has recourse to alcohol, in order to stimulate the exhausted neurons. These two factors alone—overstrain and alcohol—are, in the judgment of some neurologists, sufficient to produce general paralysis. But even if this judgment be not well founded, even if syphilis be a necessary antecedent to general paralysis ; nevertheless, overstrain and alcohol, if they do not result in this formidable malady, result in a complete breakdown of the nervous system. In many cases absolute insanity which necessitates confinement may not result ; and it is, therefore, impossible to obtain full statistical data as to the increase of nervous disorders ; but nervous disorder means none the less a weakening of the individual constitution, and places the individual who is subject to it at a disadvantage in the struggle for life. And if nervous and neuropathic persons are allowed to survive and multiply on equal conditions with non-nervous persons, then a general racial degeneracy of the nervous system must be the consequence.

In whatever way we look at it, alcoholism, therefore, appears as a pathological factor in the fullest sense of the word. It is an ever-growing menace to civilisation. We think that we have been able to give reasons for this statement, which is not made at haphazard, or on the strength of popular beliefs, but which finds ample confirmation in the various statistics which we have given. Alcoholic insanity and general paralysis—the two forms of mental disease directly attributable to alcoholic excess—are constantly and alarmingly on the increase; and their increase is accompanied by a corresponding increase in the consumption of alcohol. We have given statistics only for Paris, but Paris is the most brilliant example of a modern city; it is the centre of European life, and it sums up the various aspects of life in all civilised countries. What is true in this respect for Paris is equally true for all the other centres of civilisation. And we would remark, further, that the influence of alcohol as a pathogenetic factor in nervous disease is as incontestable as its influence in mental disease, which is nervous disorder at a higher potential; just as the rate of insanity is increasing, so also is the rate of neurasthenia. This is an observation common to all neurologists. Both as regards the production of mental disease and of nervous disease we must look upon alcoholism as the greatest enemy of race progress and the most potent factor in racial degeneracy.

IV.

Turning now to the influence of the seasons on insanity, alcoholism, and general paralysis, what do we find? With regard to the influence of the seasons on the rate of insanity in general, we find that the insanity-rate exhibits the same up-and-down movement as the suicide-rate; but, lest we should be tempted to draw the conclusion that both these phenomena proceed from the same cause, it is well to recollect that the rate

of insanity by no means coincides in other points with the rate of suicide; and that, notably, the countries most afflicted with insanity are not those most afflicted by suicide, nor *vice versa*. Nevertheless, it is very remarkable that the maximum in the rates alike of insanity in general, of suicide, and of alcoholic insanity in particular, should be reached in June, while the maximum in the rate of general paralysis is reached in May. This coincidence between the rate of increase and decrease of these different phenomena cannot be purely fortuitous, and it shows us that some general cause, at all events, must underlie the occurrence of all.

TABLE G.—STATISTICS SHOWING THE INFLUENCE OF SEASONS ON THE RATE OF INSANITY IN GENERAL.¹

Month.				Men.	Women.	Total.
January	..	..	..	383	252	635
February	..	..	..	324	255	579
March	..	..	..	409	283	692
April	..	..	..	437	313	750
May	..	..	..	457	306	763
June	..	..	..	472	302	774
July	..	..	..	420	262	682
August	..	..	..	400	258	658
September	..	..	..	391	272	663
October	..	..	..	391	268	659
November	..	..	..	390	286	676
December	..	..	..	357	251	608
Total	..	..	..	4,831	3,308	8,139

With the exception of February, we notice a regular increase in the number of cases from January till June; and with the exception of November, a correspondingly regular decrease from June till December. What the precise causes are which determine these exceptional fluctuations in the second and eleventh months of the year we are unable to say. But with these two exceptions the rate of increase and decrease follows the same course in the case of insanity as it does in the case of suicide.

¹ Statistics of the Prefecture of Paris, 1886-88.

If now, instead of considering insanity in general, we examine the movement of the rate of alcoholic insanity in particular, we shall find that the maximum is likewise attained in June, and that this maximum is followed by a regular decrease until December.

TABLE H.—STATISTICS SHOWING THE INFLUENCE OF SEASONS ON THE RATE OF ALCOHOLIC INSANITY.

Month.	Men.	Women.	Total.
January	125	26	151
February	107	25	132
March	120	28	148
April	175	31	206
May	173	27	200
June	200	50	250
July	198	34	232
August	166	30	196
September	160	19	179
October	134	43	177
November	135	31	166
December	120	32	152

The rate of increase from January till June fluctuates slightly from month to month, but the result is an increase from 151 cases in January to 250 cases in June. The rate of decrease from June to December is absolutely regular. If we examine for the four quarters of the year the variations in the rate of alcoholic insanity we come to the following result :

	First Three Months, January to March.	Second Three Months, April to June.	Third Three Months, July to September.	Fourth Three Months, October to December.
Men ..	352	548	524	389
Women ..	79	108	83	106
Total ..	431	656	607	495

Thus we find the quarterly maximum occurs in the second period of the year, during the closing month of which the monthly maximum of the rate is reached.

If we turn our attention now to the influence of seasons on the rate of general paralysis, we find that the maximum is attained in May, whereas June occupies the second place, slightly inferior to May, which has a total greatly larger than that of any other month. The fluctuations from month to month are more frequent in the rate of general paralysis; but it is remarkable that the minimum is obtained in the rate of general paralysis, as in that of alcoholic insanity and of insanity in general, in February.

TABLE HI.—STATISTICS SHOWING THE INFLUENCE OF SEASONS ON THE RATE OF GENERAL PARALYSIS.

Month.	Men.	Women.	Total
January	63	18	81
February	44	20	64
March	65	29	94
April	62	32	94
May	80	40	120
June	79	32	111
July	54	15	69
August	44	26	70
September	52	19	71
October	50	21	71
November	66	17	83
December	52	19	71

If we examine the quarterly variations of the rate of general paralysis, we find that, as in the case of alcoholic insanity, the quarterly maximum is reached in the second annual period (April to June).

QUARTERLY VARIATIONS IN THE RATE OF GENERAL PARALYSIS.

	First Quarter.	Second Quarter.	Third Quarter.	Fourth Quarter.
Men	172	221	150	168
Women	67	104	60	57
Total	239	325	210	225

The above statistics, we may note, are calculated from the returns of the Paris Prefecture infirmary for the years 1886-88, and given by us in Tables A and C.

Summing up the result of our inquiry into the influence of the seasons on insanity in general, on alcoholic insanity, and on general paralysis, we note, in the first place, that the minimum of all three rates is reached in February ; while the maximum is reached in June for the first two, and in May for the last. Although the minimum is actually reached in February, this month is altogether exceptional ; for the general movement of all three rates shows an advance during the first six months of the year, and this reaches its culminating point in June, or, in the case of general paralysis, in May and June. This increase is followed by a decrease in the rate during the latter half of the year—from July to December.

If we add to these results those already obtained as to the influence of seasons on suicide—which likewise reaches its maximum in June, and is followed by a decrease from July till December—can we draw from these results any conclusions as to the influence of seasons on conduct in general, or as to the relations existing between social phenomena and thermal variations ?

We may reply that, if seasons have an influence on conduct, they do so through the medium of the social *milieu*. Between social phenomena and thermal variations there exist definite relations, and according to the influence which these thermal variations exercise on social phenomena—according as, owing to the state of the weather, the conditions of social life are of greater or lesser intensity—will individual conduct be affected by thermal variations.

Thus the individual, considered as a social being, is determined in his evolution by the evolution of society ; and climatic variations, themselves governed by immutable and iron laws, nevertheless react on different societies in different ways, ac-

cording to the specific degree of evolution and the specific constitution of each. Reacting on society, such variations necessarily react on the individuals in their social existence ; but the individuals thus affected are affected only through the social medium. Determined in its constitution by purely intrasocial forces, a society is reacted upon by extrasocial forces according to the nature of that constitution. A warlike society, whose pursuits are mainly bellicose, will exhibit most activity during that period of the year in which the days are longest—in which, consequently, the climatic variations are most suitable for the aims of that society. A pastoral society, as far as it exhibits any marked degree of activity, is most likely to manifest it during that period of the year most favourable for the feeding of flocks. And an industrial society is likewise likely to manifest the greatest amount of activity when the days are longer and when the temperature is more favourable to the stimulation of energy. Thus it may seem as if, indeed, the same period of the year—that is to say, the same thermal variations—were favourable to all forms of society ; and this is very generally true. Nevertheless, we have not here to do with a relation of necessity, or of cause and effect. The activity of the society, whether military, or pastoral, or industrial, is not determined by thermal variations : it is determined by the intrasocial forces inherent to that society ; and the society does but utilise, so to speak, the thermal variations for the manifestation of its inherent activity.

Thus, to take the civilised society of to-day, we find ourselves in presence of a feverish economic activity, which is not, however, the result of thermal and climatic conditions, but of the development of industry ; and this in turn is a result of the development of the applied sciences, consequently of the intellectual evolution of humanity. This economic activity is, *a priori*, more likely to manifest itself vigorously during the second quarter of the year—that is to say, during that period in which the tem-

perature is moderate and most favourable to activity of all kinds. This *a priori* hypothesis we find to be verified *a posteriori*. The economic activity of society is greatest during the second period of the year, and it is precisely during this period that we find recorded the greatest number of cases of suicide, of insanity in general, of alcoholic insanity, and of general paralysis. We are justified, therefore, in seeing a direct connection, a direct relation of cause and effect, between the economic activity of society and the increase of suicide and insanity—an increase which breaks off just at the moment when the economic activity of society relaxes somewhat in July; and which continues its decrease until the New Year, when social activity begins to show more vigour.

And this result of modern social evolution will surprise no one, or ought to surprise no one, when we reflect on the conditions of social life to-day—that there is, on the one hand, a hyperactive movement of social metabolism, and on the other growing social disintegration. On the hyperactive nature of the social metabolism it is needless to insist. Every one is aware of what the conditions of social life are, of the *Hasten, Drängen und Jagen* which characterise the present phase of social evolution in all industrial countries. And the accompanying social disintegration—is this a fact? We would reply that *a priori* it would be astonishing if disintegration were not at work. At one end of the social scale we have idleness and parasitism; at the other misery and overstrain. In order to have a society well integrated we require to have a society which is worth living for. To-day the parasitic classes cannot possibly find society worth living for; they cannot possibly have an interest in its eugenic—that is to say, its highest—welfare; for how can anything be worth living for if it be not worth working for? And the working classes? The conditions of life imposed upon them by the development of industrialism and modern economic conditions are not such as to render them enthusiastic for the main-

CHAPTER III

SYPHILIS AS A SOCIAL FACTOR

IN treating of social pathology, while recognising the influence of such factors as insanity, alcoholism, and tuberculosis in determining social degeneracy, we are apt to neglect the influence of another factor which is also of importance to the race, and which, if neglected, may lead to grave dangers. Possibly this underestimate of the social dangers of syphilis is due in part to the views expressed by Herbert Spencer, who quotes with approval the testimony of fifty-four Nottingham doctors to the effect that "syphilis is very much diminished in frequency, and so much milder in form that we can scarcely recognise it as the disease described by our forefathers."¹ It would be invidious to remark that very possibly these fifty-four Nottingham doctors may not have been either very experienced syphiligraphists or very experienced neurologists. However that may be, their opinion is not shared by the leading authorities on syphilis. Possibly, however, the underestimate of the social dangers of syphilis is caused by the fact that syphilis is chiefly considered only in its *individual* aspects; and the repercussion of individual syphilis on the community is not sufficiently taken note of.

Syphilis, however, does undoubtedly constitute a danger to society, and it is certainly a factor which must be taken account of when the problem of racial degeneracy comes up for consideration. Syphilis constitutes a social danger by reason of

¹ Spencer, *The Study of Sociology*, 21st edition, pp. 83-88.

the fact that it is both infectious and hereditary, and also by reason of the very grave organic injuries which it produces. And especially does syphilis constitute a social danger in its relation to diseases of the nervous system. Since the real nature of what is now known as parasyphilis has been ascertained, the danger has increased tenfold.

In the first place, syphilis constitutes a danger for the race in its individual aspects. It is true that those serious results which were a common feature of the malady half a century ago are to-day rarely, if ever, observed; and, as a general rule, it is undoubtedly a fact that syphilis has become more benign in its external aspects. But to conclude that, because the pathological results formerly observable are to-day rarely, if ever, observable, therefore syphilis is much milder than it formerly was, is to ignore the fact that syphilis has undergone a transformation. While the treatment by mercury appears to have greatly reduced the danger of purely syphilitic disease, it is wholly inefficacious against results of a parasyphilitic nature; and it is especially in its repercussion on the nervous system that syphilis is dangerous. To-day we recognise as having a syphilitic origin a number of serious diseases with which syphilis was formerly not connected, as, for instance, general progressive paralysis, locomotor ataxy, and cerebral syphilis. In itself syphilis constitutes an evil for the race; but when we bear in mind that syphilis is not limited in every case to its own peculiar symptoms, but that it may cause lesions of almost all the organs of the body; when we bear in mind, further, that syphilis reacts with particular frequency on the cerebral and nervous systems; when we keep these ultimate consequences of syphilis in view, we cannot fail to appreciate the importance of this factor in the etiology of race degeneracy.

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of the pathological results which may be a consequence of syphilis. As may be seen from the list enumerated by Professor Fournier, almost every organ of the body may be affected.¹

NATURE OF THE RESULTS OF SYPHILIS.

					Number of Cases observed (Total of 4,400).
Tertiary syphilis (cutaneous outbreaks)	..	..	..	..	1,451
Cerebral and Nervous Systems	Cerebral syphilis	..	..	..	758
	Locomotor ataxy	..	..	..	631
	Cerebro-spinal ataxy	..	..	..	45
	General progressive paralysis	..	..	..	83
	Syphilis of the spine	..	..	..	135
Tertiary lesions of the reproductive organs	..	..	..	..	271
" " of the tongue	..	..	..	..	262
" " of the palate and roof of the mouth	..	..	..	..	215
" " of the pharynx	..	..	..	..	94
Syphilis of the bones	..	..	..	..	519
Lesions of the testicles	..	..	..	..	245
" of the eye	..	..	..	..	110

Not to make this list longer, we have selected only the most numerous results of syphilis ; the list, however, includes the larynx, the lungs, the heart, the aorta and the arteries, the liver, the kidneys, the ear, the throat, the alimentary canal, etc. And a single glance at the above figures suffices to convince us of their gravity. Out of a total of 4,400 cases, there are no fewer than 758 of affection of the brain ; and if we were to add all the cases of affection of different parts of the nervous system together, we should arrive at the formidable total of 1,652. The consequences of these syphilitic lesions of the brain and the nervous system are incalculably serious ; motor troubles, such as hemiplegia, intellectual degeneracy, death, these are the most frequent consequences. As Professor Fournier remarks : " Le système nerveux est la victime préférée du tertiariisme . . . le principe de la syphilis, s'il constitue un poison de tout l'être, constitue surtout et principalement un poison du système nerveux."

And what are the results of cerebral syphilis ? Professor

¹ A. Fournier, *Danger social de la Syphilis*, p. 11. Paris, Delagrave, 1905.

Fournier has observed the termination of 354 cases of cerebral syphilis ; these 354 cases had the following results : 79 cases were cured ; 66 cases terminated fatally ; 209 survived, but at the expense of infirmities which, in every case, were incurable.

If we calculate the percentage of these figures we find that 22 per cent. of the cases of cerebral syphilis were cured, that 19 per cent. ended fatally, and that 59 per cent. allowed of the survival of the patient, but in a condition of intellectual or motor paralysis equivalent to death. Thus, 78 cases in every 100 ended either fatally or with incurable results, as against 22 cases which recovered. And it cannot be objected that cerebral syphilis is a rare disease ; we have seen that out of a total of 4,400 cases observed by Professor Fournier, there were no fewer than 758 of cerebral syphilis, or over 17 per cent.

These figures require no comment, and they afford sufficient reply to the contention that syphilis is a benign disease. We have remarked on the aggravation of the nature of syphilis as a result of the connection discovered between syphilis and a number of diseases of the nervous system of which medical science had formerly no idea ; for if we are therapeutically well armed against syphilis proper, we have no defence against the para-syphilitic affections, such as locomotor and cerebral ataxy and general progressive paralysis ; and on the list of the 4,400 cases which we have noticed these three diseases together number 759 cases, the same number as that of the cerebral syphilis. Adding the total of cerebral syphilis to the total of the other three diseases of the spinal cord, we find 35 per cent. of the total number of cases affecting the brain, the spinal cord, and other parts of the nervous system, most of them being either fatal or incurable.

Thus, syphilis is a danger to the community, even if we consider it only in its individual aspect. But syphilis becomes more especially a danger to the race when we take into account its contagious and hereditary nature. With regard to family life,

which necessarily forms the basis of all social life beyond the primitive stage, syphilis presents a social danger from three points of view : contamination of the wife, dissolution of the marriage, and material ruin of the family through the physical or intellectual incapacity of its bread-winner following as a consequence of syphilis.

Here are three points which it is important to note when we consider syphilis as a factor of racial degeneracy. And these cases are not few and far between. Professor Fournier, in an important document communicated to the French Academy of Medicine twenty years ago,¹ declared that, as a result of personal observation and of prolonged investigation, he found that an average of 20 per cent. of the women infected by syphilis were infected during their married life by their husbands. Thus, one woman out of every five who have been syphilitically infected is an innocent woman who has contracted the disease, with all its attendant risks and perils, from her husband during their married life ! These figures prove sufficiently that syphilis is not the monopoly of the prostitute and irregular class ; but that no fewer than 20 per cent. of syphilitic patients among women, on an average, are honest married women who are thus tainted through no fault of their own. Comparative statistics as to syphilis are impossible to obtain—at all events, reliable statistics—but there is every reason to suppose the average amount of syphilis to be very similar in all civilised countries ; and if, in Paris, different researches have shown that from 19 to 23 per cent. of syphilitic women are infected by their husbands, there is no reason for supposing the figures to be appreciably different in London, Berlin, Vienna, Brussels, St. Petersburg, or any other great European city.

The investigations carried out by Professor Fournier as to the sources of syphilitic infection in women give us indeed a

¹ A. Fournier, *Document statistique sur les Sources de la Syphilis chez la Femme*, in *Bulletin de l'Académie de Médecine*. Paris, October, 1887.

terrible result, and one that may well make optimists pause. It is impossible to arrive at an estimate of the total number of syphilitic women for various reasons ; and only if we could obtain reliable statistics on this point during a given period could we calculate approximately the total number of syphilitic married women, basing our calculation on the above-mentioned percentage-rate of one married woman for every five patients. But even without knowing the exact number of syphilitic women, there is reason to suppose them to be numerous. And when we reflect that one out of every five is an honest married woman, on whom the race is dependent for its continuance, we may well dilute somewhat the optimism of Herbert Spencer, based on the opinion of fifty-four anonymous Nottingham doctors.

It is an argument not unfrequently used, in order to justify the suppression of prophylactic measures against venereal disease, that syphilis is the monopoly of the world of prostitution. In the first place, this argument, as we have seen, is utterly wrong in regard to a matter of fact, for syphilis is not the monopoly of this particular class ; and, in the second place, even supposing that it were thus monopolised by prostitutes and irregulars, could it be seriously contested that it is therefore not a social danger ? As if, through the medium of prostitutes and irregulars, society cannot be profoundly contaminated ! It is nothing to the point to say that the man who has been contaminated has only himself to blame ; science has nothing to do with arguments based on morality, but only with arguments based on fact. The question of " fault " has no connection with the matter ; we are in presence of a fact—the fact that syphilis is a very grave disease, capable of doing much harm to the race ; and of the circumstances in which syphilis is communicated we need take no account. Science knows neither moral nor immoral diseases ; it knows only disease as disease, and its only mission

is to combat disease with all the means at its disposal, on account of the dangers which it presents for the eugenic welfare of the race.

As to the second consequence which syphilis in the husband entails on the family—namely, dissolution, or, at all events, weakening, of the marriage-tie—it is needless to enter into details. It will suffice to say that it is a consequence fatal to the stability of family life, which is the groundwork of social life, and that it is a consequence which is more frequent than might be supposed. We will come at once to the third consequence for the family, that the bread-winner, as the result of syphilitic disease, is incapable of supporting the family which he has founded.

In considering the social and racial consequences of syphilis, it is important to note a clinical fact observed by Professor Fournier to the effect that 49 per cent. of the expressions of tertiary syphilis manifest themselves *after* the first period of ten years of the syphilitic infection;¹ to be exact, 2,814 tertiary symptoms out of a total of 5,767 manifested themselves subsequent to the tenth year of infection. The repercussion of this clinical observation on the social aspect of syphilis is very considerable. It proves, in a word, that in half the cases in which tertiary syphilis has been observed the married man and father pays the bill, to use Professor Fournier's expression, which has been run up by the young man. In 50 per cent. of cases, if not more, syphilis is contracted in the early years of manhood, between the ages of eighteen and twenty-five; the general age of marrying is from twenty-five to thirty-five; and it is the married and responsible man who has to suffer for the imprudence of the young man, or for neglecting to undergo a proper course of treatment. Those cases of syphilis known as benign are particularly dangerous in this respect. How many cases are there of syphilis which are wholly ignored by the patient!

¹ *Danger social de la Syphilis*, p. 33; vide also *L'Hérédité syphilitique*, by A. Fournier. Paris, 1891.

And how many more in which the syphilitic manifestation is unimportant, being confined to a slight cutaneous outbreak ! The patient imagines that all is well, that he is cured ; and, as a matter of fact, all may go well for ten, fifteen, twenty, even thirty, years, and then suddenly there is a formidable tertiary expression, such as locomotor ataxy, or general paralysis, or blindness, or deafness, or some other equally grave complication. And the man thus struck down by misfortune may be a model husband and father, whose family, unless they are fortunate enough to possess means of their own sufficient to live upon without the work of the bread-winner, is reduced to beggary and misery. This is no exaggerated statement. Syphiligraphists and other medical men can cite thousands of such cases known to them ; and we must remember that the family conditions of hospital patients are not known to them, for in the hospital it is solely the patient's malady which concerns the doctor. We may conclude that if it often happens that patients sufficiently well off to be nursed at home are thus led into shallows and miseries, the amount of misery among those who are compelled to go to hospital must be much larger still. Considered from this point of view, syphilis must be reckoned a factor of considerable importance in the causation of social misery ; and those who are aware of the obstacles placed by economic misery in the way of eugenic evolution cannot contemplate this influence of syphilis with optimism.

Syphilis is thus a social danger because of the damage it does to the individual, and because of its harmfulness to the life of the family. But, looking at it as an agent in the etiology of race degeneracy, there is a third social consequence of syphilis which is more serious still ; and this consequence is to be sought in the hereditary results of the disease, in the repercussion of the syphilitic affection on the children and even on later generations.

Professor Tarnowsky, of St. Petersburg, has recently published

the conclusions reached by him as the result of his observations on twenty-five syphilitic families, each of whom the author has followed from a clinical point of view through three successive generations.¹ The following conclusions, in view of the authority and competence of Professor Tarnowsky on this question, may be reproduced :

“ 1. It is in the second generation of the syphilitic family that the hereditary influence of acquired syphilis manifests itself with the greatest intensity, in producing a considerable number of abortions, of stillborn infants, of infants which succumb at the end of a few months of existence, of infants afflicted with symptoms of hereditary syphilis, or with various anatomical and functional abnormalities.

“ 2. The immunity of the second syphilitic generation is generally only temporary, except in extremely rare cases.

“ 3. The influence of hereditary syphilis diminishes sensibly in the third generation ; this attenuation is manifest in the diminution of the number of abortions, etc., as also by the reduction of the number of abnormalities of a hereditary syphilitic nature.

“ 4. The hereditary transmission of syphilis from the grandparents to the grandchildren, without any infection of the intermediary generation, has not been observed, and is very doubtful.

“ 5. When the second syphilitic generation is not marked by any symptoms of a hereditary syphilitic nature, and if it is not tainted by any other unfavourable hereditary variation, apart from syphilis, it generally produces healthy descendants.

“ 6. To sum up, the hereditary influence of the syphilis contracted by the first generation manifests itself by abortions, by the procreation of stillborn children, of children who succumb at an early stage of life, of children tainted by hereditary syphilitic

¹ B. Tarnowsky, *La Famille syphilitique et sa Descendance* (Clermont, 1904); see also *Archives d'Anthropologie criminelle*, tome xx., p. 849. Lyons, 1905.

symptoms, by malformations, or by other abnormalities ; this hereditary influence is strongest in the second generation of the syphilitic family, diminishes in the third, and vanishes from the fourth generation onwards."

Professor Tarnowsky adds his conviction that "syphilis exercises an incomparably worse influence on race and society than on the individual," and that the "disease does not so much menace the patient himself as his descendants." And when we come to analyse the above conclusions of the eminent syphiligraphist, we shall not find much cause for congratulation. It is true that the occasional immunity from hereditary syphilitic influence from the third generation onwards is insisted upon ; but what are the conditions of this immunity ? That the second generation of the syphilitic family be not contaminated by syphilis ; and, further, that no other unfavourable variation—no nervous or constitutional disorder—be present to exercise its influence. And how often are these conditions realised ? How often is the second generation of the syphilitic family exempt from syphilis ? And how often may not a nervous or constitutional disorder exist even where syphilis has not been inherited ? This conditional immunity is practically reduced to zero.

And now let us glance at the consequences of hereditary syphilis in the second generation, in which Professor Tarnowsky declares the disease to manifest itself with greatest force. Firstly, hereditary syphilis destroys the offspring, in the majority of cases, during the first months of conception ; hence the frequent syphilitic abortions. Secondly, it may kill the offspring at a more advanced period of gestation ; hence the premature births, which are also very frequent. Thirdly, it may kill the offspring at birth ; children are either born dead, or survive only a few hours. Fourthly, it kills the offspring with merciless severity during the first weeks of their existence. According to the statistics of the Charity Board in Paris (*Assistance Publique*), out of a total of 996 children born in the hospitals from syphilitic

mothers during the period 1880-85, 458 were either stillborn or survived only a short period ; thus, the proportion of infantile mortality, due solely to syphilis, was no less than 40 per cent. And, fifthly, it kills at a later age, when adolescence is already reached.

The abortions and premature accouchements due to syphilis may occur repeatedly in the same woman ; thus, Fournier cites the case of one of his patients who had no fewer than twelve successive abortions, due entirely to the influence of syphilis. In the same way, we find numerous families in which, in addition to abortions, two, three, four, or more children have successively been carried off in early age by the disease. We need only cite a few examples given by Professor Fournier, and drawn from the statistics furnished by different clinicians :

RATE OF INFANT MORTALITY IN VARIOUS SYPHILITIC FAMILIES (AFTER
PROFESSOR FOURNIER).

8 deaths in 11 births.				10 deaths in 14 births.			
8	"	"	11	10	"	"	11
8	"	"	11	11	"	"	12
8	"	"	9	11	"	"	12
8	"	"	9	12	"	"	15
9	"	"	11	15	"	"	19
9	"	"	10	15	"	"	16
9	"	"	10	18	"	"	19

But although these figures are bad enough, there are worse. Professor Fournier states that he can cite hundreds of cases in which the entire family has been exterminated at birth by syphilis. He gives from among his list thirty such cases, in each of which every single child born has succumbed ; thus, in some families there are eight deaths out of eight births, or ten deaths out of ten births, or eleven deaths out of eleven births. This infantile mortality is to-day recognised as so general a sign of syphilis that it may be said that one of the characteristics of the symptomatology of syphilis is the high mortality among children.

This result of syphilitic heredity varies according as the

inheritance is paternal or maternal ; statistics show that 28 per cent. of the total number of cases of infantile death considered by Professor Fournier are due to the paternal heredity, and no fewer than 60 per cent. to the syphilitic taint of the mother. So that the maternal heredity would appear to be more than twice as dangerous, as far as regards the mortality of the offspring. It may also be remarked that the hereditary harmfulness of syphilis varies according to the age of the disease ; especially virulent during the first three years of the malady, it diminishes subsequently.¹

But the hereditary disastrousness of the disease is indeed great during its early stages. Professor Fournier has observed the case of ninety women infected by their husbands during their married life, and who became pregnant during the first year of their syphilis. The result of these ninety cases is as follows : Fifty abortions or stillborn infants ; thirty-eight infants who survived only a short time ; two infants who survived normally. Thus, two survivals out of ninety cases.

Not the least, assuredly, of the dangers of syphilis considered as a social factor are the abnormalities frequently attendant on its hereditary transmission ; and also the degeneracy of which it is an active agent. These abnormalities consist nearly always in a regressive deviation from normal growth, in malformations, which may occasionally develop into veritable monstrosities. These regressive deviations from normal growth, like all regressive deviations from the normal type, constitute a symptom of degeneracy, and are a hindrance to the individual in the struggle for life. Professor Fournier has divided these abnormalities into three categories : (1) Those which affect the individual only partially, by affecting only a single organ or a single system of organs ; (2) those which affect the entire constitution of the individual ; (3) those which, by the very excess of their abnormality, develop into veritable monstrosities.

¹ A. Fournier, *L'Hérédité syphilitique*, pp. 97 ff. Paris, 1891.

It is not our purpose here to examine in detail these various categories. A simple enumeration of some of the symptoms peculiar to each will help us to appreciate their gravity. In the first category we find all those numerous cases of maxillary, cranial, nasal, ocular, auricular, cerebral, medullary abnormalities, and many others, which are so often a lamentable feature of hereditary syphilis. The second category embraces a considerable number of pathological cases. In this category we may include the syphilitic abortive child, the stunted and atrophied specimen which seldom survives long. In this category we may include also the valetudinarian child, feeble, weak, sickly, predisposed to a number of diseases, including tuberculosis. Hereditary syphilis is one of the chief agents for preparing the ground for the reception of the tubercle bacillus; and this rôle of hereditary syphilis in predisposing to that other great social malady, tuberculosis, renders the nature of the former, from the point of view of the interests of the race, doubly dangerous. Further, we find a general fragility of life, or, as Professor Fournier puts it, a "quotient of vitality inferior to the normal quotient," which has, as a very general rule, the result that the individual succumbs to a malady which would certainly not cause the death of a healthy patient. Infantilism and rachitism are frequent results of hereditary syphilis. Although it is an error to consider rachitism as produced solely by syphilis, it is, nevertheless, very frequently so produced.

In the third category, as we have said, we find monstrosities. It is now an established fact that syphilis may result in the begetting of monstrosities, and there is nothing surprising in this fact, seeing that monstrosity is but an extreme of abnormality. In short, just as abnormality is a result of syphilis, so is degeneracy; or, rather, degeneracy is the natural consequence—the corollary, we may say—of abnormality. The syphilitic abortive child which survives but a few hours or days is a degenerate; and degenerates are also the valetudinarian, the infantile man, the

patient afflicted with rachitism, the various intellectually feeble victims of heredito-syphilis, from the simply "backward" child to the imbecile and the idiot. Thus, between syphilis and degeneracy there is a close relationship of cause and effect.

But we have not only to consider this degeneracy in so far as it affects the individual: we have also to consider it in so far as it affects the race—that is to say, we have to take into consideration the progeny of these hereditary syphilitic degenerates. We have noticed Professor Tarnowsky's conclusion to the effect that it is in the second generation of the syphilitic family that the hereditary influence of syphilis manifests itself with the greatest intensity. This conclusion is amply confirmed by the observations of other syphilologists. But the fact is also to be noted that in the *third* generation of the syphilitic family grave complications may ensue. Thus, a case is cited by Fournier of four children born of a healthy father and of a mother suffering from hereditary syphilis; all four are afflicted with rachitism (curved back, malformation of the skull, etc.), and one is an idiot.¹ Another case cited by Fournier is that of a woman afflicted with hereditary syphilis, and married to a healthy man; four accouchements resulted successively in an abortion, in the birth of two stillborn infants, and in the production of a terrible monstrosity. A third case, cited by Fournier from the observations of Dr. Etienne, relates to a healthy woman married to a hereditarily syphilitic husband; this woman was fourteen times pregnant, and the results were six dead children, five others affected with cerebral disease, one "backward" child, and two other children suffering from dental abnormality. Thus we see that the influence of syphilis can extend far beyond the second generation into the third, and with the most deplorable results. When the third generation is not, through idiocy, fortunately rendered sterile; when the rachitic or backward members of the third generation marry and reproduce; the terrible influence of

¹ A. Fournier, *Danger social de la Syphilis*, pp. 64 ff.

the original syphilis may make itself felt further, although eventually sterility must be the result of this pronounced degeneracy.

These, then, are the results of syphilis, as they make themselves felt through three or four successive generations, before sterility ultimately puts an end to this influence by effectually preventing further reproduction. Can it be maintained that a disease capable of producing these results is a "benign" disease; or that, in order to subserve an old and now exploded theory of *laissez-faire*, erected into a political dogma, we are justified in taking no prophylactic measures to safeguard the race against the obvious perils of this disease? Since the social aspects of syphilis became known, since it was recognised that syphilis has hereditary influences which were formerly unsuspected, that it is complicated by all the category of parasymphilitic complaints, it has been necessary to greatly increase our estimate of the racial dangers of the disease.

Let us now turn our attention briefly to a point which is interesting because it furnishes the material for many an objection to prophylactic measures against syphilis. It is said by those who object to the organisation of prophylactic measures against the disease that those who contract it contract it solely through their own imprudence; and although this may be sometimes the case, it is a fact that the disease is generally contracted as a result of inexperience, which is a very different thing. A classification of cases calculated on 11,000 patients (10,000 men and 1,000 women) by Dr. Edmond Fournier in Paris shows us that 5,145 cases out of these 11,000 were contracted between the ages of eighteen and twenty-five inclusive—that is to say, that over 50 per cent. were contracted during early manhood, before the first twenty-five years are over; the numbers progress steadily from seventeen to twenty-three, at which latter age is attained the maximum of 819 cases in 11,000, or over 7 per cent. When we reflect that nearly 8 per cent. of the total number of

cases are thus contracted at the early age of twenty-three, we have an idea of the gravity of the evil. How can we look at these figures without becoming aware of their serious nature, when we see that more than one-half of the total number of syphilitic victims have not passed the age of twenty-five? We have no wish to exaggerate, but really it is a serious thing for the race that more than one-half of the number of its syphilitic patients should be young men, not yet married, who are still destined to marry, and destined to produce for the misfortune of society a crowd of misbegotten progeny, tainted with all the evils which syphilis is apt to bring in its train, if they are not aborted, or stillborn, or carried off early. If syphilis attacked as a general rule that type of person known in German as a *Jubelgreis*, and who is past the age of procreating a family, the evil would be much less. But it attacks precisely, with particular virulence, the youth on which depends all the future of the race, all its virility, all its chances of survival in the struggle for existence. And the results of syphilis for the individual, for the family, and for the descendants, we have already seen.¹

Thus, the argument as to the persons who contract syphilis having contracted it knowing what they did, and knowing the possible consequences of their imprudence, falls to the ground; unless, indeed, it be seriously contended that a young man in the first twenties, *as a general rule*—for every rule, of course, has its notable exceptions—is well aware of the pathological nature and consequences of syphilis; if this be argued, there is nothing further to be said, except to retort that it is not a fact. The young man of twenty to twenty-three who has contracted syphilis has contracted it not so much through imprudence as

¹ Further examination of Dr. Edmond Fournier's statistics shows that, out of 10,000 cases, 817 are contracted before the age of twenty (in the case of men), or about 8 per cent. In the case of women, out of 1,000 cases, 209 are contracted before the age of twenty, or 20 per cent. It can scarcely be maintained that boys and girls of sixteen to nineteen years of age "act with the full experience of what they do."

through inexperience; and, the disease having declared itself, his chief anxiety is usually to conceal it, owing to the prejudice against syphilis—a prejudice which it is one of the duties of science to remove. And what is the result? The patient goes through an insufficient cure, imagines all to be well, marries a little later on, and then, ten or fifteen years later, the responsible and married man pays the bill in the shape of some terrible tertiary complication. Cannot we see that the whole result of our education must tend to an augmentation of juvenile syphilis, which already, as we have seen, constitutes more than one-half of the total, and which is the most deplorable of all forms of syphilis, for it is the one which does most injury to the race? The young man who goes to college has seldom a clear and precise notion of what syphilis is, and it is precisely what he should know. It is at least as important for the race that its young men, on whom its virility depends, should have a clear notion of therapeutics, that they should know what syphilis means for the individual, for the family, and for their children later on, as that they should be able to translate Aristophanes at sight, or read Dante in the original.

Syphilis constitutes in the highest degree a danger for the individual and for the race. It is in the interests of the race to combat it by every means in its power. We are far from saying that the supervision of prostitute women and the licensing of special houses always attains the result aimed at. Unfortunately, reliable comparative statistics as to the frequency of syphilis in different countries cannot be obtained, so that it is impossible to say definitely whether more syphilis prevails in cities like London, where no supervision is admitted, than in cities like Paris and Vienna. The comparative statistics given by Zürich and Geneva, which have adopted opposite policies in this respect, can be entirely neglected. Nevertheless, it would seem *a priori* as if supervision had the advantage, which is incontestably great, of confining the woman once found to be


syphilitic, and so far preventing further contagion. At any rate, the question is one which is sufficiently important, one would think, to be seriously considered by the London County Council, seeing that it is one which intimately concerns the physical well-being of the race.

But what is more important than the supervision of prostitute women or the licensing of special houses, important and useful though we believe these institutions to be, is the education of boys and, to a certain extent, of young girls. In France the Société Française de Prophylaxie Sanitaire et Morale, which has Professor Fournier as president, has done, and is doing, good work in this direction, chiefly through the medium of publications. In England—to our knowledge, at least—no similar society exists. And yet, better than any medical supervision of women or licensing of houses is the bringing home to the young man of *what syphilis is*—by which we mean what syphilis is for the individual and for the race. The young man who is impressed by the knowledge of what syphilis is, what dangers it can imply for him personally, what dangers for his future wife, and what dangers for his future children and grandchildren—nay, even great-grandchildren—this young man is more likely to take care to avoid the risks than he who knows nothing of these things, or has only a vague idea of them.

At school to-day great care is taken to give a boy a sound knowledge of dead languages; but absolutely no care is taken to instruct him concerning those things which most intimately concern his own bodily welfare, and that of his future wife and progeny. We have ourselves assisted, in the chapel of a public school, at the homily of a reverend head master on the sin of breaking the Sixth Commandment; but this same head master would probably have been surprised had one suggested to him the utility of imparting some knowledge to his pupils of the dangers of syphilis. But surely, if it be not thought unfit to deliver an address to boys of fourteen to sixteen years of age

on the subject of adultery ; it cannot be thought less fit to instruct them on the danger they will run of ruining body and mind, not only for themselves, but for their descendants, if they do not take certain precautions in the satisfaction of their sexual instinct. It is absurd to talk of leading them thereby into vice. There is no boy of a certain age who does not understand what the sexual instinct is—and if one sermonises them on adultery, one presupposes such comprehension on their part—and however much we may try to ignore it, it is an obvious and natural fact that every person will endeavour to satisfy that instinct. This very obvious fact being given, we believe it to be more rational to endeavour to impress on boys and young men the great perils which menace them unless the satisfaction of this instinct is accompanied by certain precautions. Our present system of education is in this respect utterly irrational. The most fundamental instinct of human nature is officially ignored, alike by parents and masters ; the boy knows nothing of venereal disease or of its prophylaxy, and the result is that he contracts syphilis with all its attendant dangers. That this is the case is shown by our statistics, demonstrating that over 50 per cent. of cases of syphilis are contracted before the age of twenty-five.

It is not by shutting our eyes to facts that syphilis will be effectually combated ; it is not by repeating pious maxims as to the “immorality” of venereal disease that we can lessen the grave danger to the race which such disease involves. It is only by taking strong prophylactic measures that we can hope to effect this, and it is a truth many times proved that education constitutes one of the surest methods of prophylaxy. It is a mistake to suppose that such education would prove to be an incitement to debauchery. There is every reason to suppose the contrary. The boy who is impressed by a sense of his responsibilities towards the race in the person of his descendants, and convinced of the dangers of syphilis, is better fitted for the



struggle for existence than the boy who is ignorant of these important matters. The latter may very possibly escape the dangers which menace him, but it will be thanks to luck ; but the former will have nine chances in ten of coming out intact from the critical bachelor period, as against one chance in ten possessed by the latter. Here we touch upon the larger question of the relations of the individual to the race, and of the duties of the former to the latter. One of the great defects of our time is the setting up of the individual as an end in himself ; whereas the force of a society is to be measured rather by the quantity of strength which it can place in reserve, so to speak, for the benefit of future generations. The aim of all education to-day seems to be the concentration of the present generation on itself. The great fact of the solidarity between successive generations, the full comprehension of which is indispensable to the eugenic progress of the race, is lost sight of in the mists of economic and metaphysical individualism. Here, again, we come to the necessity of social cohesion, to the necessity of a supreme co-ordinating principle, which shall co-ordinate the divergent activities of all the different members of society, and direct them in view of a common aim, interesting them all in an equal degree ; and this principle is the welfare of the race. Only when the individual is more convinced of his solidarity with the generations to come can we hope for social progress. When his eyes are cast only on himself, the individual appears not to be worth the struggle for life, with its accompanying suffering ; and it appears not to matter as to whether the organic constitution of the individual be adversely affected or not. But all this changes when the individual considers himself as but the link of a chain, as responsible in a large degree for the destinies, for the happiness or misery, of generations yet unborn. From this new point of view actions which might formerly seem indifferent appear now as affecting the fate of the race ; consequently, we must ponder before doing them. The extent to

which syphilis is spread over all civilised countries may be set down—at least, in part—to the excessive individualism of our time, to the lack of solidarity between the individual and the race; had the individual been more considerate of his duties towards the race, he would have been less imprudent. Here, once more, we come to the importance of social integration and social coherence; only in the measure that we appreciate the solidarity of the whole social organism, past, present, and future, can we limit our individualism by the consciousness of the necessity of race progress. When we arrive at a clearer conception of the solidarity which links successive generations together; when, consequently, our duties towards our progeny and towards the race in general are more fully realised; when, in a word, greater social integration shall have been attained, then shall we have the best of all possible prophylaxies against the propagation of syphilis. The majority of those who then succumb will be those who ignore these social duties, who are, consequently, socially inferior, and whose elimination through syphilis is, therefore, not to be regretted; whereas to-day, social feeling being still too undeveloped, syphilis attacks and renders useless many who are biologically superior, and who, had their social feeling been more developed, would have been a credit to the race. The consideration of syphilis as a social factor brings us to the same conclusion as the consideration of suicide and insanity—the conclusion, namely, that greater social solidarity is a necessity.¹

¹ It is to be remarked that, whereas tuberculosis and other diseases are beneficial in so far as they eliminate only the biologically unfit, and that the anti-tuberculosis prophylaxis may thus be considered in a sense as an instrument for preventing this elimination of the unfit, the same cannot be said of the anti-syphilitic prophylaxis. For syphilis, in its origin, may attack, and frequently does attack, the most robust and healthy organisms, which it reduces to biological bankruptcy, thereby impoverishing the social organism.

CHAPTER IV

SOCIAL SELECTION AND INVERSE SELECTION

WE have so far examined the question of selection in sociology with regard to three factors—suicide, insanity, and syphilis. On each of these three points our examination led us to the same result—that what is chiefly lacking in our social institutions of to-day is integration and coherence. Let us now glance at the condition of social selection from other points of view; and we shall see that this further examination will but confirm our provisions as to the insufficiency of our present phase of social evolution to maintain the level of biological efficiency, which it is essential that the social structure should possess if it is to continue to ensure the eugenic progress of the race. We shall find that social evolution has not, up to the present, been conducive to race progress; and that in some cases it has been antagonistic to this progress.

This affirmation may appear paradoxical to those who are accustomed to accept the theory of social progress as a dogma; and who, without examining the facts of the case, imagine Western civilisation, as we know it to-day, to be the ultimate goal of progress. It is important, when considering the question of social progress, to distinguish carefully between eugenic and traditional progress: eugenic progress is the biological progress of a race; traditional progress is the progress of a race in the domain of sociology proper, in that of institutions, of traditions, of intellectual culture in general. We are far from denying the traditional progress effected by the advance of civilisation; but

it is an error to consider traditional progress as synonymous with biological progress, or to suppose that the one implies the other as a matter of course. Certainly the intellectual culture of society; the institutions which embody that culture; the mechanical progress which is its concrete result; the industrial and commercial development which are the accompaniments of that mechanical progress; the power of man over Nature, which has its sources in the great increase of knowledge—all these cannot be denied. And it would be equally foolish to attempt to deny the great benefits which society has derived, and is deriving, and will continue to derive, from the extraordinary development of those non-biological factors which link one generation to another independently of all physiological heredity. In a brilliant passage, Macaulay has thus recorded the benefits which humanity has derived from the philosophy of Francis Bacon: "It has lengthened life; it has mitigated pain; it has extinguished diseases; it has increased the fertility of the soil; it has given new securities to the mariner; it has furnished new arms to the warrior; it has spanned great rivers and estuaries with bridges of form unknown to our fathers; it has guided the thunderbolt innocuously from heaven to earth; it has lighted up the night with the splendour of the day; it has extended the range of the human vision; it has multiplied the power of the human muscles; it has accelerated motion; it has annihilated distance; it has facilitated intercourse, correspondence, all friendly offices, all dispatch of business; it has enabled man to descend to the depths of the sea, to soar into the air, to penetrate securely into the noxious recesses of the earth, to traverse the land in cars which whirl along without horses, and the ocean in ships which run ten knots an hour against the wind."¹ But all this vast and wondrous progress which Macaulay so eloquently and so justly extols is progress *in the domain of tradition*, according to our definition. And this progress in the domain of tradi-

¹ Macaulay's *Essays*, pp. 403, 404 (popular edition).

tion may not be accompanied by corresponding progress as regards the physique of the race. While the applied sciences have been conquering the world, the biological value of the social unit may have made no progress, or it may even have receded.

Our consideration of certain social phenomena, such as suicide and insanity, has indeed shown us that there is another side to Macaulay's glowing picture. A society which has attained to the development of scientific progress reached by Western civilisation to-day is certainly separated from the savage tribes of the Dark Continent and elsewhere by an immeasurable distance ; but it is an error to consider solely the strides made by society in the domain of tradition, or to judge of the value of a society solely by its mechanical activity, by its industrial and commercial prosperity, or by the external solidarity of its institutions. It is, to say the least, equally important to consider the vital or biological progress of that society, and to observe the inner working of its apparently admirable institutions. A society in which the number of suicides is constantly increasing, as compared with the increase of the whole population ; a society in which insanity, alcoholism, and general paralysis show an equally constant and alarming increase, cannot be said to be evolving along a road of unqualified progress. The question must obviously arise whether the institutions of that society are in reality as admirable in their working as they appear to a superficial observer ; in a word, even its progress in the domain of traditional values must be questioned. And another question which must inevitably follow is whether the increase of insanity, alcoholism, and general paralysis does not imply a positive biological regression, a positive contamination of the germ-plasm of the race.

That traditional and racial progress do not necessarily go hand-in-hand is proved by history. The Athenians, at the time of their overthrow by Philip of Macedonia, possessed a social

culture and social institutions certainly superior to those of their adversaries ; but the biological inferiority of the Athenians is certain. On the other hand, the Huns of Attila, who helped to annihilate the empire of the Cæsars, were possessed of undoubtedly immense biological superiority ; but they lacked all social culture, and consequently all that stability which is derived from social culture, and the result was that they were unable to found anything enduring to replace what they had destroyed. In order that a race may maintain itself, its progress in the domain of tradition must be balanced by a corresponding progress in physical well-being. Although cultural development may possess the greatest *immediate* importance—so that, for instance, a biologically superior race lacking social culture may be defeated by a race which is biologically equal, but which possesses social stability—nevertheless, in the long run the race which is biologically degenerate will eventually succumb ; for this degeneracy of its members will react on its institutions, and annihilate its acquirements in the domain of sociology proper, social stability being ultimately dependent on biological capacity. One of the best examples of such a case is afforded us by Rome. Rome triumphed over the Gauls, not because the Roman was, as a whole, biologically superior to his adversary, but because Rome possessed greater social culture. But precisely the conditions of that social culture were such as to favour a biological regression of the race ; which ultimately succumbed as a result of its own internal degeneracy. Thus, if social progress, in the strict sense of the word, is not necessarily synonymous with biological progress ; there is, nevertheless, connection between the two, in so far as the biologically degenerate race cannot continue indefinitely to maintain social stability. However perfect the institutions of a society may once have been, they cannot resist the action of the biological regression of the race. On the other hand, a race which is biologically superior is not by any means necessarily possessed of social culture. The Red Indians, before the advent of the white man, were a very fine race as regards

biological qualities ; but they lacked the social organisation of the white man, and were necessarily vanquished by him.

Thus, the ideal society would be that which combined the maximum of social culture with the maximum of biological value. But this, like all ideals, is impossible of realisation, and we must content ourselves with approximating to it as far as possible.

When we come to examine the question of the relation of biological to social selection, we are at once met by difficulties which arise out of the very complexity of the matter. On the one hand, it is evident that, in the struggle for existence between societies, social culture is an indispensable weapon. However fit a society may be from the biological point of view, if social culture, and the stability which is a consequence of such culture, be absent, that society will fall a victim to a rival society which is disciplined, organised, and stable, the biological value of both races being equal. On the other hand, biological fitness also has its cardinal importance in the struggle between societies ; and if a society which is biologically unfit and socially fit is better adapted to the conditions of existence than a society which is biologically fit but socially unfit, the former must, however, succumb before a society which is both biologically and socially fit. It is certain that biological fitness reacts upon social stability and culture ; and if the organisation of a society be such that the operation of the law of natural selection is restricted or prevented, so that biological regression is allowed to set in, that society is doomed to disappear before one in which natural selection secures the removal of the biologically unfit ; and which is otherwise equal as regards the degree of social culture. And, even should such an antagonistic society not be forthcoming, it is certain that, sooner or later, the society first described will succumb to the deficiencies and vices of its own organisation.

Although social culture is indispensable in the struggle for existence between societies, it is a mistake to regard such culture

as in any way replacing biological selection. The one must accompany the other, and the organisation of society must be such as to allow of the full operation of the law of natural selection among its members. Thus, the test we may apply in judging of the fitness of a given society is this : Is its organisation such as to allow of the operation of the law of selection within that society, and thus to provide for the survival of the fittest alone ? And to this definition may be added the corollary that " fittest " in society life means the fittest not *only* from the biological, but also from the social, point of view—that is to say, the society which is best adapted to the conditions of existence is that which contains the greatest number of persons with well-developed social instincts and of well-developed biological fitness.

Is this the case with Western civilisation to-day ? In the first place, it may be remarked that to secure greater biological fitness *pari passu* with greater social fitness is certainly not the aim of our Western civilisation ; so that, even if it were attained, it would be by accident. As Haycraft remarks : " There is every reason to believe that, on account of improved external conditions, and notably of the sanitary advances which result from the efforts of preventive medicine, the race is deteriorating in general constitutional robustness. Those selective agencies which in more primitive times destroyed the sickly, especially during the early years of their life, have in part been removed or modified, with the result that the sickly are preserved, and in larger numbers live through and into the child-bearing period, raising the mean duration of life, but notably increasing the rate of mortality after middle age. These sickly ones leave children behind, who, as a matter of course, transmit their constitution to the race."¹ It may be replied that these are platitudes, but they are platitudes which concern the very life of the race. Even if, owing to the peculiar circumstances in which it may be placed, a race which is biologically inferior, which seeks through its social polity to counteract the effects of natural selection,

¹ *Darwinism and Race Progress*, p. 90. Sonnenschein, 1900.

which sets as an aim to its polity the greatest possible multiplication of life, irrespective of the *quality* of that life—even if such a race be protected against annihilation by outside foes which are biologically superior, it will nevertheless decay ; it will not play any *rôle* in the history of the world, and the judgment of history will pronounce it to have been a failure. For a race can thrive only on condition that the qualitative superiority of its component individuals is maintained. The feeble, the weak, the maimed members of society are unable to fulfil their duty either towards themselves or towards their race. The aim of life, in so far as we are justified in attributing to life an aim, must be its fullest possible expansion ; for such an expansion is implied by the very idea of life. The late M. Guyau expressed this so well that we cannot do better than reproduce his words : “ Nous croyons qu’une morale exclusivement scientifique, pour être complète doit admettre que la recherche du plaisir n’est que la conséquence même de l’effort instinctif pour maintenir et accroître la vie ; le *but* qui, de fait, détermine toute action consciente est aussi la *cause* qui produit toute action inconsciente : c’est donc la vie même, la vie à la fois la plus intense et la plus variée dans ses formes. Depuis le premier tressaillement de l’embryon dans le sein maternel jusqu’à la dernière convulsion du vieillard, tout mouvement de l’être a eu pour cause la vie en son évolution ; cette cause universelle de nos actes, à un autre point de vue, en est l’effet constant et la fin.”¹ What is true for the individual is equally true for the race. The aim of the race must be its expansion—nay, we may say that its very existence as a race depends upon its expansion. The conditions of civilisation may be such as to prevent the *direct* annihilation of a biologically inferior race by its foes ; but no conditions can possibly prevent its indirect annihilation. That is to say, the race may continue to exist, but only as a shadow of its former self ; it will no longer be capable of adding

¹ M. Guyau, *Esquisse d’une Morale sans Obligation ni Sanction*, p. 87. Paris, 6th edition, 1903.

to the stock of the world's treasure ; it will exist, even as a paralytic exists among the bustle and activity of the surrounding persons ; but it will be worthless to the world—worthless morally and worthless commercially, and its decay, perhaps slow, will be inglorious, if not infamous. Such is to-day the position of Turkey ; which in the sixteenth century menaced Vienna, and which now exists only because of differences among those who would fain devour it. Such to-day is also the position of the once-proud Egyptian civilisation ; and such is also the position of Morocco, whose name five centuries ago was the terror of Western Europe.

In the domain of organic life progress is the universal law. Regression implies decay, and life never remains stationary for indefinite periods. In the domain of sociology it is the same. The race or the nation which ceases to expand, which has exhausted all its force of expansion, is doomed, sooner or later, to disappear. This is one of the great lessons of history ; and doubtless it is the great lesson taught also by those civilisations which flourished and disappeared without leaving any historical record of their life and vicissitudes. But if the expansive force of a race is to be maintained, it is necessary, as we have said, that the race should have a large majority of persons possessing well-developed social instincts and biological fitness.

Among the nomadic and pastoral races the law of natural selection operates with full force. Among the hunters those members of the race who are less swift or less keen of vision are eliminated ; and the working of this law has the result of maintaining the whole race at a very high biological level. As civilisation advances, the conditions tend to become more and more favourable to the reproduction of individuals possessing less biological efficiency ; and to a superficial observer it may seem as if there were a certain necessary antagonism between biological efficiency and social organisation. This, however, is not really the case ; for we have seen that the efficiency of a race

rs depends, in virtue of the fundamental law of life itself, power of expansion ; and a race which has exhausted its r of expansion must decay. But obviously the expansive r of a race can only be maintained on condition that its bers, in addition to having highly developed social instincts, kewise organically fit. And should it appear as if the organisa- and growing stability of a society are in opposition to the tenance of its biological fitness, the truth is that the line of tion pursued by that society has been illusory ; and that its rent stability is in reality a condition of instability, pregnant dangers for the future of the race. Athens affords us an lent example of this ; her social culture was admirable, her tutions were attractive in a high degree ; and yet we see that apparently perfect organisation concealed vices fatal to the nued existence of the race.

ring the earlier stages of social evolution war plays a very rtant part in the elimination of the unfit and weaker bers of society. When one savage tribe attacks another, onflict is decided in favour of the one which contains the er number of individuals possessing courage, good eyesight, ness, cunning, bodily strength, and endurance ; so that we say with truth that conflict plays here a most valuable ive rôle. Even when we ascend much higher in the scale ilisation, we find war to be a useful factor in race progress. agehot writes : " War both needs and generates certain es—not the highest, but what may be called the preliminary es : valour, veracity, the spirit of obedience, the habit of pline. Any of these, and of others like them, when possessed nation, and no matter how generated, will give them a ary advantage, and make them more likely to *stay* in the of nations. The Romans probably had as much of these cious virtues as any race of the ancient world—perhaps as as any race in the modern world too. And the success of ations which possess these martial virtues has been the means by which their continuance has been secured in the

world, and the destruction of the opposite vices ensured also. Conquest is the missionary of valour, and the hard impact of military virtues beats meanness out of the world.”¹ But it is especially in the lower stages of civilisation that we observe the value of war. The hunting and the pastoral races are compelled periodically to go in search of new hunting-grounds or new pastures for their flocks ; the extension of their territories, their *expansion*, is a physiological necessity, whenever the old territory becomes used up. In this early stage failure to expand means swift and sure annihilation ; and, in order to expand, in order to conquer new territories, it is necessary, above all things, that the tribe should possess *fitness*, physical fitness, capacity for endurance, courage, cunning, bodily strength. The individuals who are less fit in these respects, who are weak or sickly, are ruthlessly exterminated.

War under these conditions is obviously a selective factor of great value and importance. But it is a remarkable fact that the value of war as a factor of biological and social selection is in inverse ratio to the degree of traditional culture attained by the race. Whereas in the lower stages of civilisation war acts by the elimination of the unfit ; in the higher stages, including our own, it acts by the elimination of the fit. That this statement is not paradoxical we shall shortly see.

In countries in which compulsory military service prevails—as is the case throughout the continent of Europe—those who are allowed to serve, as a result of medical examination, are those who are most fit in the biological sense of the word. Those who suffer from any physical defect, whose eyesight is poor, who are afflicted with shortsightedness or deafness, whose constitution is weak and sickly, are all excluded from military service. Only those who have attained a certain degree of physical robustness and health are saddled with the burden of military service. What is the result ? It is obvious that the man who has to serve for two or three years in barracks, who is compulsorily withdrawn

¹ W. Bagehot, *Physics and Politics*, pp. 74, 75. Kegan Paul.

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that time from ordinary civilian life, and is thus temporarily prevented from following his career—it is obvious that this man placed at a disadvantage in the economic struggle for existence compared with the man whose career is not thus arbitrarily interrupted. And as in our industrial civilisation to-day the economic aspect is the predominant one, it follows that the biologically less fit have more chances of gaining a livelihood and marrying early, consequently of rearing a numerous progeny, and are the biologically more fit.

See here the contradiction to which the military system prevalent in Europe brings us! But this state of affairs has consequences more far-reaching still. If the biologically unfit are favoured at the expense of the biologically fit—and it cannot possibly be questioned that two or three years' start in the economic struggle constitutes an immense advantage—the ultimate result must be a biological regression of the entire race. Early marriage means greater fecundity; and if the biologically fit are able to obtain, at an early age, the means necessary for founding a family, their average fecundity must be somewhat greater than the average fecundity of the biologically fit. If we suppose the fecundity of the former to be only very slightly greater—for instance, in the proportion of 3·3 to 3·4, i.e., in the proportion of 1 : 1·03—nevertheless, in the course of time, the more fertile race will have doubled its numbers at the expense of the less fertile. Thus :

$$\begin{aligned} 1\cdot03x &= 2 \\ x &= 23\frac{1}{3}.\end{aligned}$$

That is to say that after $23\frac{1}{3}$ generations the race of the biologically unfit will have doubled at the expense of the race of

If we suppose a population composed of two different races, each of which is represented by an equal number of individuals, but whose fertility is slightly different, each couple of the race A producing 3·3, and each couple of the race B producing 3·4 children; then at the end of 23 generations the race B will have doubled the numbers of A—the numbers of both being originally equal, and the initial inequality of 1 : 1·03 beginning with the second generation.

the biologically fit. Here we come at once to a most serious result of modern militarism ; it must produce, in the long run, a regression of the biological average of the entire race.

But this is only the negative side of this inverse selection. The positive side is manifested as the result of the operations of war. As we have said, the biologically fit alone are selected for military service ; therefore it is they alone who are decimated by war. It has been calculated that the wars of the French Revolution of 1789-95 cost the lives of 1,800,000 Frenchmen and of 2,500,000 foreigners. The wars of the Empire were more costly still ; it is calculated that they were responsible for the destruction of 2,600,000 Frenchmen and 3,500,000 Europeans of other extraction, thus reaching a total of over 7,000,000. Add to this number that of the victims of the Revolutionary wars, and we get an approximate total of 11,500,000 of slain in less than twenty years, exclusive of those countless indirect victims of every war who perish from war's attendant miseries. It has been calculated that the Crimean War cost upwards of 750,000 lives ; the American War of Secession, 330,000 ; the Prusso-Austrian War of 1866, 150,000 ; and the Franco-German War of 1870, 215,000. According to statistics furnished by M. de Lapouge, Europe and America have lost, through war, no fewer than 9,450,000 lives since 1815 ; if we add this number to that of the 11,500,000 victims of the wars of the Revolution and Empire, we get a total of nearly 21,000,000 lives lost in this manner in a little more than a century for civilised nations alone.¹ If we could say that these 21,000,000 lives represent the biologically unfit and degenerate portion of humanity, there would be every reason to congratulate ourselves on this elimination of the waste matter of the community ; in that case we could truly say that war was a beneficial institution in our modern civilisation, an indispensable instrument of selection. But, as we have said, these 21,000,000 lives unfortunately represent the bio-

¹ G. de Lapouge, *Les Selections sociales*, p. 222. Paris, 1896.

logically fitter members of the race ; this annihilation is thus equivalent to a positive impoverishment of the latter.

Space and food are both limited ; and we must recollect that the greater the multiplication of the less fit, the greater the chances of the degeneracy of the whole race. For the greater the amount of space and food monopolised by the unfit, the less space and food is there left for the fit, whose multiplication is thus hindered. And the organic welfare of the race as a whole depends on the multiplication of its fittest members. The 21,000,000 lives lost through war may be taken as representing as a whole the biologically fitter elements of Europe ; their destruction means the loss of progeny to a great number who were as yet unmarried. Even if we suppose only 10,000,000 of these to have been unmarried—which is an underestimate—we may, calculating an average of two children to each, reckon a loss of 20,000,000 children in the second generation ; and at the end of five generations, had these wars not intervened, we might reckon on an increase of 160,000,000 children belonging to the biologically fitter elements of the race. If we suppose that non-appearance of these has been compensated for by the production of an equal number of progeny among the inferior elements, we may reckon at 320,000,000 the number of organically fitter individuals lost to the race in the space of five generations through war alone.

But this is only the *direct* consequence of war ; the deficit of 320,000,000 biologically fit individuals is due to the direct destruction occasioned on the field of battle. There are, however, indirect consequences ; the very circumstances under which all war is waged must necessarily cause an increase in the normal death-rate among non-combatants. It is calculated by Lapouge that the Franco-German War of 1870 caused an excess of upwards of 450,000 deaths among the non-combatants above the normal rate.¹ The exact figures are always difficult to obtain in such a

¹ G. de Lapouge, *Les Selections sociales*, p. 231. Paris, 1896.

case, owing to the serious disturbance of all social life caused by invasion ; nevertheless, Lapouge calculates that the death-rate, which was 864,000 in 1869, rose to 1,046,000 in 1870, and attained 1,271,000 in 1871, falling again to the figure of 793,000 in 1872. In this connection it is important to remember that large numbers are of cardinal importance in race progress. In the first part of this work we saw that, in order that the species may be maintained at the high level necessary to its existence, it is essential that natural selection should have a vast number of individuals from which to choose, a vast number of variations which can be sorted out and selected. Thus, the species presenting the greatest number of individual variations will be more exposed to the beneficent action of natural selection, and consequently will have more chance of being always *adapted* to its environment. Only, however, if there are a sufficient number of individuals can a sufficient number of variations be forthcoming to ensure the necessary minuteness of adaptation. In the realm of nature there are degrees of adaptation : some individuals are minutely adapted in all their parts, others are less delicately adapted ; but the former are the fittest for survival and reproduction. And precisely these minutely adapted organisms cannot be produced without a rich and abundant material for selection to act upon. Let us take an example from the phenomenon of coadaptation. If the antlers of the stag are to develop, it is necessary that the muscles of the neck be developed, and also the muscles and sinews of the legs, etc. That is to say that, if it be advantageous for the stag that its antlers should develop beyond a given point, it is necessary, in order that this development be effected, that the muscles of the neck and of the fore-legs be previously or contemporaneously developed. Among the individuals composing the species, the action of germinal selection may bring forth a number of variations affecting different parts of the body ; but only those individuals who present variations in the sense of a development of the muscles of the neck and fore-legs will be selected.

Obviously, if the species is to maintain itself, if its normal number is to suffer no decrease, a number of individuals presenting this necessary variation must be forthcoming, equal to the total normal number of the individuals of the species ; nay, this number must be greater, because necessarily some variations, although in the same direction, will be less complete, and consequently less valuable biologically. In order to bring about this necessary change in the species, it is thus evidently essential that an immense number of individuals be to hand, in order that the necessary selection of those who present the favourable variation in question may be made.

Thus war, with its attendant military system, constitutes, under modern conditions, a factor of inverse selection ; alike by the positive destruction of the biologically fitter elements and by the disturbance which it must induce in the normal birth and death rates of the non-combatant community ; and also by reason of the economic obstacles which the modern military system places in the way of the biologically fitter elements. Militarism and war, in our modern civilisation, far from being the selective factors which they are supposed to be, constitute, on the contrary, an absolute obstacle to race progress. It is useless to retort, as is sometimes done, that in war only the weakest are slain. In the first place, even supposing this were true, the weakest who succumb on the field of battle would still, as a whole, be organically superior to the non-combatants who, in countries of compulsory service, are only exempted because of physical incapacity. But, in the second place, this allegation is not always founded on fact. The bullets of the enemy may reach the fittest and the less fit alike.

To resume, we may say that the European States, which together maintain 3,200,000 men under arms on a peace footing, are at a disadvantage in the economic struggle with a country like the United States, which maintains only 36,000. And, as the economic aspect is the fundamental aspect of our present

civilisation, the outlook cannot be described otherwise than as unfavourable for the States of Europe.

Let us now consider another aspect of our social life from the point of view of selection. The basis of our modern social system is the institution of private property ; against this institution in itself there is nothing to be said, and much can be urged in its favour. The classical school of economists most certainly neglected a great and important side of man's nature when they attributed his whole *Streben* to greed of gain alone ; but they were incontestably right in affirming that the hope of individual profit is a strong incentive to action and a constant aid to progress. Under our present social system, however, not content with rewarding the individual efforts of the worker who has triumphed by dint of greater intelligence and industry, we confer on his progeny, who may have contributed absolutely nothing to his success, the benefit of the latter. From the biological point of view there can be little doubt that the hereditary nature of private property acts as a factor of social inverse selection ; since it protects in many cases the idle and worthless at the expense of the hard-working and intelligent.

It is not our present purpose to enter upon an examination of the many aspects under which the question of social " classes " can be considered.¹ Nevertheless, we may take for granted that the average value of the leisured classes, from the bio-social point of view, is greater than the average bio-social value of the whole community. This is indeed an *a priori* supposition ; but it is justified by the facts which we may examine *a posteriori*. It cannot, we think, be seriously questioned that the upper classes —by which we by no means mean solely the aristocracy, but

¹ An important work of classification of the different social classes has been undertaken by one of the leading representatives of that Italian school which, founded by Lombroso and developed by Ferri, has made such valuable contributions to anthropology. We refer to Niceforo's work, especially *Les Classes Pauvres*. Paris, 1904.

also the intellectual and professional classes and the upper *bourgeoisie*—are, on an average, superior to the community as a whole. This fact being granted, it is obvious that it is greatly to the interest of the community that the fertility of these superior classes should be greater than that of other classes. For a diminished fertility on the part of the upper classes, and an increased fertility on the part of the lower classes, would mean a multiplication of the less fit at the expense of the more fit; consequently, it would entail an organic regression of the entire race.

What, then, are the facts? Are the upper classes, the intellectual and professional classes, the scholars and statesmen, the shrewd factory directors and business men—are all these increasing as they should? Is their fertility at all events equal to, if it is not greater than, the fertility of the working and artisan class?

M. Jacques Bertillon has established the statistics with regard to this question for the four chief cities of Europe—Paris, London, Vienna, and Berlin.¹ The method by which he proceeds to establish the opulent or indigent nature of the various quarters of these different cities is the following:

1. In every quarter, among 1,000 households of at least two persons, how many female servants?
2. Among 1,000 marriages, how many marriage settlements?
3. Among 1,000 individuals inhabiting the quarter, how many indigent persons in receipt of relief?
4. Among 1,000 individuals having a profession, how many are working-men?
5. Among 1,000 individuals, how many inhabit overcrowded dwellings?

This method is easily justifiable. Firstly, the number of servants gives an idea of the wealth of a household; secondly, the frequency of marriage settlements in any quarter is a sign

¹ J. Bertillon, *La Natalité selon le degré d'aisance*, in *Bulletin de l'Institut International de Statistique*, tome xi., Première Livraison, pp. 163-176. St. Petersburg, 1899.

of prosperity, for the poor, having nothing to settle, do not form these contracts; thirdly, the greater the poverty of a quarter, the greater the number of persons in receipt of relief; fourthly, only poor persons call themselves working-men; fifthly, it is obvious that an opulent quarter will not have many overcrowded dwellings.

If we divide the twenty *arrondissements* of Paris into six categories, according to their various degrees of poverty and wealth, we arrive at the following results:

BIRTH-RATE OF THE ARRONDISSEMENTS OF PARIS
ACCORDING TO THE DEGREE OF WEALTH.

AVERAGE NUMBER OF ANNUAL BIRTHS PER 1,000 WOMEN FROM 15 TO
50 YEARS OF AGE (1889-93).

Very Poor.	Poor.	Well-off.	Very Well-off.	Rich.	Exceptionally Rich.
(5) 108	(3) 95	(5) 72	(2) 65	(4) 53	(1) 34

The figures in brackets show the number of *arrondissements* included in each category. The other figures represent the average number of births for every thousand women from fifteen to fifty years of age. We see that the fertility of the *arrondissements* is in inverse ratio to their material prosperity. To this rule there is not a single exception; the birth-rate diminishes with absolute regularity from the very poor to the exceptionally rich quarters. Of the latter, there is only one—the quarter of the Élysée—and in this the average birth-rate is thirty-four, or less than one-third of what it is in the quarters designated as very poor; the average of the latter, again, is double that of the four *arrondissements* classed as rich.

The same results are obtained in the other great European capitals—London, Berlin, and Vienna. M. Bertillon has applied to each of these great cities the method which he applied in Paris with regard to the classification of the different city quarters. In the case of London he has arrived at the following results, based largely on previous researches made by Mr. Charles Booth:

District.		How many Indigent in 1,000 Inhabitants in 1891?	How many Annual Births (Still-born Children not Included) in 1,000 Women from 15 to 50 Years 1881-1890?
Very poor districts	Holborn ..	48·9	139
	St. George's-in- the-East ..	48·9	164
	Bethnal Green ..	44·6	157
	St. Saviour's, Southwark ..	43·4	139
	St. Olaves ..	42·2	153
Poor districts	Shoreditch ..	40·2	150
	Whitechapel ..	39·2	137
	Stepney ..	38·0	150
	Greenwich ..	36·8	118
Districts which are well off	Poplar ..	36·5	153
	Islington ..	31·2	106
	London City ..	31·5	78
	St. Pancras ..	30·4	113
Districts which are very well off	Camberwell ..	28·6	110
	Strand ..	28·5	94
	Wandsworth ..	27·4	97
	Marylebone ..	27·4	97
	Mile End ..	26·1	146
Rich districts	Lambeth ..	26·1	116
	Woolwich ..	24·7	120
	Fulham ..	24·7	98
	Kensington ..	24·7	64
	Chelsea ..	24·5	111
	Hackney ..	23·1	97
	Paddington ..	21·7	68
	St. George's, Hanover Square ..	21·6	75
Very rich districts	Lewisham ..	18·1	75
	Hampstead ..	13·5	49

This table is less regular than the table of the *arrondissements* of Paris. For instance, Mile End, which has a comparatively low rate of poor relief, has a high birth-rate—higher than that of St. Saviour's, Southwark. It must be remarked, however, that the birth-rate includes only those births which have occurred in the dwelling-houses; and in a poor district like Southwark many women are necessarily delivered in the hospitals; so that the birth-rate here given by M. Bertillon may be somewhat lower in the case of the poorer districts than it is in reality. It must

further be remarked that M. Bertillon has omitted several districts, such as Norwood, Streatham, Dulwich, Blackheath, and Highgate, which are all of them wealthy districts, or at all events very well off. However, this omission does not in any way affect the value of the results set forth in the above table, which may be summarised as follows :

	Average Birth-rate per 1,000 Women.			
Five very poor districts	147
Five poor districts	140
Three districts (well off)	107
Six districts (very well off)	107
Seven wealthy districts	87
Two very wealthy districts	63

Thus, in London, as in Paris, the wealth of a district is in inverse ratio to its birth-rate, the latter diminishing steadily as the former increases.

The same results are obtained in Berlin and Vienna. Berlin is divided into sixteen different *Standesämter*, which M. Bertillon has classed as he has classed the twenty *arrondissements* of Paris, according to their degree of opulence or poverty. The following are the net results obtained :

Very Poor.	Poor.	Well-off.	Very Well-off.	Rich.	Very Rich.
(2) 157	(3) 129	(4) 114	(3) 96	(3) 63	(1) 47

The figures in brackets show the number of *Standesämter* included in each category ; the other figures show the average annual number of births for 1,000 women from fifteen to fifty years of age during the period 1886-94. Here, again, we find steady and regular diminution of the birth-rate according as the material prosperity of the *Standesämter* increases.

In Vienna the same phenomena are seen. Vienna is divided into nineteen *Bezirke*, and, still following the classification adopted by M. Bertillon, we get the following result as regards the birth-rate of each category :

Very Poor.	Poor.	Well-off.	Very Well-off.	Rich.	Very Rich.
(4) 200	(4) 164	(3) 155	(2) 153	(5) 107	(1) 71

The figures in brackets show the number of *Bezirke* included in each category ; the other figures show the average annual number of births for 1,000 women from fifteen to fifty years of age during the period 1890-94. In Vienna we find the same law once more amply confirmed—namely, that the birth-rate varies in inverse ratio to the degree of material prosperity.

It may be objected that the material prosperity of a district is, in the first place, no guarantee of the intellectual or moral or physical value of its inhabitants ; and, secondly, that no connection necessarily exists between material prosperity and intellectual or moral or physical value. We hold, nevertheless, this argument to be fallacious. It is true that no necessary relation exists between material prosperity, as such, and personal value. It cannot, however, be denied that the districts classified as “ well off ” and “ rich ” are those which contain the intellectual, professional, and business classes, whose social value, whether physical or mental, has an average which is above that possessed by the working classes who inhabit the districts classified as “ poor.” Social progress does not emanate from the masses, but from the superior elect. And it is a serious phenomenon, this greater fertility of the lower classes. We have seen that greater fertility, even if its excess be minimal, produces results which are, in the long run, quite out of proportion to the original degree of excess. In the case of the lower social classes, the difference in the rate of fertility, far from being minimal, is very marked, and it indicates the multiplication of the less fit at the expense of the fit ; consequently, it must involve social degeneracy.

What are the reasons for this difference in the rate of fertility between the upper and lower classes—a difference so pregnant with danger for all social progress ? The fundamental reason is undoubtedly to be found in our economic system. The progress of industrialism, by increasing the comfort of man, has at the same time raised his standard of life ; but this industrial progress has almost exclusively affected the upper classes of society.

True, the standard of life of the working man is no longer what it used to be : it also has advanced to a higher level ; for so profound a modification of the whole social structure as that effected by the introduction and growth of industrialism could not but have its influence on all classes. But the claims of the working-man are modest, none the less, and the satisfaction of them is, for the average man, a matter of no great difficulty. Every honest working man may reasonably hope, after a few years' toil and thrift, to have accumulated sufficient means to be able to found a family. And to this may be added the fact that the labouring classes are not, as a rule, either prudent or far-seeing ; they marry and undertake all the responsibilities of a family without much weighing of the pros and cons, trusting very often to the chance of the future ; and this imprudence is undoubtedly responsible for a great part of the misery and suffering unhappily so prevalent in these circles. The upper classes, on the other hand, whose standard of life has been raised by the industrial system, have seen their wants augmented in a corresponding, if not in a disproportionate, degree. The standard of life in these classes is one which demands for its attainment in each successive generation many years of hard work ; and these classes, being as much subject to the universal law of competition as the lower, and having a standard of comfort less easily reached than that of the labouring population, are naturally more impeded than the latter in the fulfilment of their primary duty as members of society—marriage and reproduction. Add to this the fact that the professional, intellectual, and business classes are more far-seeing than the labouring classes ; that they do not so willingly or so easily incur the responsibilities attendant on the founding of a family, and we see at once one of the reasons—perhaps the most important one—for the greater fertility of the labouring classes. For it is evident, from what we have said, that the upper classes will marry later in life, and the later the marriage the less the fertility.

been calculated that the relation of age to the degree of fertility is as follows :¹

Marriage Age of the Man.				Number of Children per Married Couple.
Less than 25 years	..	..	...	3.50
25-29 years	..	..	..	3.25
30-34	..	..	..	3.02
35-44	..	..	..	2.28
45-50	..	..	..	1.10

see that the earlier in life a man marries, the more children he is likely to have. The upper social classes, marrying at a later age than the lower, produce a lower average of children. The following was the average age of married men in Italy in 1896, calculated according to the professions :²

Profession.	Average Age of Bachelor at the Time of contracting Marriage.		
	Years.	Months.	Days.
bricklayers	25	6	15
sculptors, photographers	26	6	6
dent artisans (blacksmiths, ironworkers, tailors, bootmakers, etc.)	26	9	20
agricultural labourers, shepherds	27	1	28
factory workers	27	7	20
fishermen, boatmen	27	9	13
clergymen, gentlemen at large	27	10	22
mechanics	28	1	9
proprietors, factory directors, managers	29	1	25
masters, tutors	29	11	13
clerk and private officials	30	—	19
lawyers, solicitors, doctors, professors, etc.	31	—	29
(army and marine)	33	2	24

bin and H. Westergaard, *Statistik der Ehen auf Grund der sozialen der Bevölkerung*, p. 95. Jena, 1890.

seri, *Sur les Variations du Taux de Natalité et sur l'Âge moyen suivant les Conditions économiques*, in *Bulletin de l'Institut International de Statistique*, tome xi., Première Livraison, p. 157. St. Petersburg,

We have taken Italy on purpose ; for the economic conditions, and the struggle for existence which results from them, are less developed in that incomparable country than in the northern and central civilisations of Europe ; so that it must be, on the whole, easier for the upper classes in Italy to marry early than it is for the same classes in England or France or Germany. Not only is the economic life less intense, but the Italian nature is, as a consequence, more inclined to frugality—in a word, the standard of life required by the upper classes is not only somewhat less exorbitant than that required further north, but it is easier of attainment. Nevertheless, we find in Italy that the three categories which marry, on an average, at the age of thirty and upwards are precisely those which are the most educated and most cultured, and those whose multiplication is most beneficial for the community : the official class, the professional and learned classes, and the officers' class. And, on the other hand, the categories whose members marry at the earliest age, and which may therefore be held to be most fertile, as a general rule, are those of the masons, bricklayers, and artisans. If this is the condition of affairs in Italy, much more must it be the condition prevailing in the economically more developed countries.

That this supposition is correct is shown by the statistics given by M. Raseri for England, for the period 1884-85 :

Profession.	Average Age of Bachelor at the Time of con- tracting Marriage.					
Miners	24·06
Textile industries	24·38
Bootmakers, tailors	24·92
Artisans	25·35
Journeyman	25·56
Commercial travellers	26·25
Shopkeepers	26·67
Agricultural labourers	29·23
Liberal professions, etc.	31·22

We find, further, the Registrar-General writing in 1893 to the effect that " the mean age at marriage has been steadily rising

ever since 1873, the mean age for each group in 1893 being the highest on record. Further evidence that marriage is now deferred to a somewhat later period of life than formerly is afforded by the decline in the proportion of under-age marriages.”¹ In the Sixty-third Annual Report of the Registrar-General for 1900 we find a table showing this steady decline in the proportions of marriages under age since 1871-75. The proportion of such marriages, which was 81·6 per 1,000 for men and 223·2 per 1,000 for women during the period 1871-75, was reduced to 51 per 1,000 for men and 163 per 1,000 for women in 1900.

Thus there appears to be no doubt that, not only is marriage contracted at a later period of life by the professional and cultured classes than by the labouring classes, but that the general age of marriage for the whole community is rising; and this is, for the physiological reason that early marriage is conducive to greater fertility, and late marriage to lesser fertility, a pathological symptom which clearly shows the unhealthy conditions of modern civilisation. In 1892, in the Fifty-fifth Annual Report, the Registrar-General had already noticed “an increasing tendency to defer marriage until a somewhat later period of life.” In 1898, in the Sixty-first Annual Report, the Registrar-General, after noting that the mean of the recorded ages of bachelors who married was 0·01 year less in 1898 than in 1897, added that “the general tendency in recent years has been for this figure to increase; it would be unsafe to infer that the slight decrease during the year under notice (1898) indicates a returning tendency towards early marriage. The mean recorded age of spinsters who married was greater in 1897 than it had been in 1896, and it again shows an increase in 1898.” And, as a matter of fact, in the following year—1899—in the Sixty-second Annual Report, we read that “if the bachelors who married in 1899 be

¹ *Fifty-sixth Annual Report of the Registrar-General of Births, Deaths, and Marriages*, p. viii (1893).

divided into two groups, those who married spinsters and those who married widows, the mean of the recorded ages of each group shows an increase on the corresponding mean in the previous year." So that we may take it as a proved fact that the mean age of marriage for the community as a whole is rising.

We have given above some statistics which show that the lower classes marry, as a general rule, earlier than do the cultured classes, from which the liberal and learned professions are recruited. That the result is a greater fertility of the lower at the expense of the cultured classes is an *a priori* deduction from a well-known physiological law. It might, however, be urged that the greater mortality among the artisan and labouring classes compensates for their greater fertility; and we may certainly see in the excessive mortality among these classes a reason for their fertility, since we know that the fertility of a species is in direct ratio to the chances of destruction to which its members are exposed. It is extremely difficult to draw from the statistics of comparative mortality among the different social classes a definite conclusion regarding the proportion of mortality to fertility in each of these classes; but it appears certain that the greater mortality-rate among the lower classes does not bear the same proportion to the lower mortality-rate of the upper that the respective birth-rates bear to each other; in other words, despite greater mortality, there is a net excess of fertility among the lower classes. Dr. Schallmayer, after a detailed examination of the figures given by numerous statisticians concerning the proportion of the mortality-rate among different classes of the population, comes to the following conclusion: "We must conclude that the results obtained up till the present do not give us an entirely accurate idea of the degree of the difference between the rate of child mortality among the upper and that among the lower classes. . . . But if one wishes to draw conclusions from the results detailed above, one will have to admit that the rate of difference between the

mortality among the children of the higher officials, wealthy merchants, etc., on the one hand, and that among the children of the labouring classes on the other, is at the most a difference in the ratio of 1 : 1½ for those who inhabit large cities, and considerably smaller for the country populations.”¹ We might, indeed, deduce this fact from the phenomenon presented by the German and Polish populations to-day ; the Poles are far more fertile than the Germans, and their death-rate is also higher. But the higher death-rate does not suffice to compensate for the higher birth-rate, and a net excess of fertility remains to the Poles after all deductions are made. The same phenomenon is witnessed in the respective birth and death rates of the upper and lower classes. Accepting the figures given by Dr. Schallmayer² concerning the relative proportion of the death-rate of the upper classes (by which we mean those who have enjoyed secondary and higher education) and of the lower classes — namely, 1 : 1½—we find that, glancing only at the figures presented by the city of Paris, the proportion in which the birth-rate among the categories classed as “very poor” and “poor” stands to those classed as “very well-off,” “rich,” and “exceptionally rich,” is that of 1 : 1½ approximately. So that we may reckon that, for every 100 persons born in the first two categories, 75 are born in the wealthy categories ; but for every 100 deaths in the first two, there are 80 deaths in the latter ;

¹ W. Schallmayer, *Vererbung und Auslese im Lebenslauf der Völker*, p. 166. Jena, 1903.

² Lest it be objected that it is invidious to cite Dr. Schallmayer in particular, we would reply that his conclusions are based on a conscientious and thorough examination of statistics relating to the proportion of the mortality-rate among different classes of the population, tabulated by Professor Conrad (*Die Bevölkerungsstatistik*, Jena, 1902), by Professor Westergaard (*Mortalität und Morbilität*, Jena, 1902), by Seutemann, Körösi, and numerous others. The closer examination of this most important question necessitating details for which space is here lacking, we can but reproduce a judgment based on the diligent scrutiny and analysis of numerous statistics ; which consequently merits our attention.

thus, there is a net excess of multiplication on the part of the lower at the expense of the upper categories.

One of the reasons for the late marriage of the cultured and educated classes is, as we have seen, to be found in our economic conditions. These have raised the standard of life and increased the keenness of competition, and thus have made greater effort necessary in order to reach a pecuniary situation permitting of the founding of a family; and although they react with greater intensity on the cultured and educated classes than on the labouring classes, they nevertheless have a certain influence on the whole social organism. This influence is expressed in the statement of the Registrar-General to the effect that the mean age of marriage for the entire community is steadily on the ascendant; and what is true for England is true for all those Western countries whose economic development is proceeding under the same conditions. These are facts which it is the duty of the sociologist to take note of; for late marriage is not only undesirable as a general rule, because of its effects on fertility; but we must also bring the phenomenon of more prolonged general celibacy into connection with our remarks in Chapter III. concerning syphilis. Syphilis, we said, is contracted in the majority of cases between the ages of eighteen and twenty-five—that is to say, by persons destined to marry and to produce the future generations of our race. And no one even cursorily acquainted with the dangers of syphilis for others beside the individual affected—dangers which we insisted upon in the previous chapter—can doubt that this postponement of marriage until an even later age will have a marked influence on the increase of syphilis; and consequently that the social dangers of the disease, already great, will thereby be multiplied.¹

¹ “In the middle classes a man’s income seldom reaches its maximum till he is forty or fifty years old, and the expense of bringing up his children is heavy, and lasts for many years. The artisan earns nearly as much at twenty-one as he ever does, unless he rises to a responsible post, but he

Let us now turn our attention to the selective value of our social institutions as shown in the general trend of social evolution. We are compelled to recognise that the advance of the applied sciences, on the one hand, has been of inestimable value in increasing the knowledge of man, in multiplying his comforts, and in strengthening his mastery over the forces of Nature. But from another point of view it is difficult not to admit that the influence of that evolution of society primarily determined by the progress of applied science has been harmful to the biological welfare of the race. As we have already said, the astonishing advance made in our social life must not be confounded with any advance which may possibly have been made in our biological value as a race. For, not only can social evolution, as embodied in the institutions and traditions of society, make great progress without being accompanied by any corresponding biological progress, as incarnated in the physical and psychical development of the race; but a regression in the sphere of biological values can coexist with the attainment of ever greater perfection in social evolution proper. We have said that Athens affords the most striking example of such a case; but many other examples could be cited.

If it be universally recognised that our social evolution has in many ways increased the comfort of man; and if our present

does not earn much before he is twenty-one; his children are likely to be a considerable expense to him till about the age of fifteen, unless they are sent into a factory, where they may pay their way at a very early age; and, lastly, the labourer earns nearly full wages at eighteen, while his children begin to pay their own expenses very early. In consequence, the average age at marriage is highest among the middle classes; it is low among the artisans, and lower still among the unskilled labourers" (Professor A. Marshall, *Principles of Economics*, p. 258). It is well to remember that the middle classes constitute the element from which the intellectual professions are recruited; and the bio-social value of these classes is certainly higher on an average than that of the artisan and unskilled labouring classes.

institutions are a solid advance on the institutions of the ancient régime in France ; it cannot be maintained that, from the point of view of race progress, they are calculated to inspire confidence. Without recapitulating the facts already arrived at in support of this contention, we may at once proceed to remark that the very tendency of our institutions, of our present phase of social evolution, contains an imminent danger for such progress. The humanitarian tendencies of modern times, which are pre-eminently the fruit of democratic teaching, may very possibly lead, and do as a matter of fact lead, to results contrary to those which it was hoped to attain by their means. Their object is to diminish suffering, and, more often than not, they increase it. Herbert Spencer has most truly remarked that "fostering the good-for-nothing at the expense of the good is an extreme cruelty. It is a deliberate storing up of miseries for future generations. There is no greater curse to posterity than that of bequeathing them an increasing population of imbeciles and idlers and criminals. To aid the bad in multiplying is, in effect, the same as maliciously providing for our descendants a larger host of enemies. It may be doubted whether the maudlin philanthropy which, looking only at direct mitigations, ignores indirect mischiefs, does not inflict more misery than the extreme selfishness inflicts."¹ The tendencies and results of social evolution among Western nations are well summed up by Dr. Haycraft when he writes that "we are rapidly diminishing those selective agencies which in the past have developed race vigour. . . . This increased preservation of the sickly has had the effect of increasing the life-period of an average child. . . . Improved sanitary surroundings, as we have seen, are taken advantage of chiefly by the sickly ; and thus with our increased probability of life we have diminished the average robustness of constitution, or innate healthiness, of the

¹ Spencer, *The Study of Sociology*, 21st edition, p. 340. Williams and Norgate.

race, for a larger proportion of sickly ones are living amongst us.”¹ But Herbert Spencer especially has effectively warned us against the dangers of modern humanitarianism :

“As fast as more and more detrimental agencies are removed or decreased, and as fast as there results an increasing survival and propagation of those having delicately balanced constitutions, there arise additional destructive agencies. Let the average vitality be diminished by more effectually guarding the weak against adverse conditions, and inevitably there come fresh diseases. An average constitution previously able to bear without derangement certain variations in atmospheric conditions and certain degrees of other unfavourable actions, if lowered in tone, will become subject to new kinds of perturbation and new causes of death. In illustration I need but refer to the many diseases from which civilised races suffer, but which are not known to the uncivilised. Nor is it only thus that the rate of mortality, when artificially decreased in one direction, increases in another. The very precautions against death are themselves in some measure extra causes of death. Every further appliance for meeting an evil, every additional expenditure of labour, every new tax to meet the cost of supervision, becomes a fresh obstacle to the living. A society of enfeebled people, then, must lead a life like that led by a society of people who had outlived their vigour, and yet had none to help them, and the life also must be like in lacking that vivacity which makes enjoyment keen. In proportion as energy declines, not only do the causes of pain increase, but the possibilities of pleasure decrease.”²

It is assuredly a great pity that Friedrich Nietzsche is, to all intents and purposes, unknown in England. The philosopher who, with Schopenhauer, has exercised incontestably the greatest influence on the continent of Europe during the nineteenth century, the great thinker who has moved so many intellects, inspired so much enthusiasm, called forth such bitter criticism—this is the thinker who is contemptuously ignored in England. If the dislikes of a people are any criterion of its value, this ignoring of Nietzsche, so eminently typical of the country of the Nonconformist conscience, might be taken as a symptom of that racial degeneracy and morbidity which certain writers have

¹ J. B. Haycraft, *Darwinism and Race Progress*, pp. 60, 61. Swan Sonnenschein.

² *The Study of Sociology*, pp. 336, 337.

deplored. However, this is by the way, and we would merely point out that the sociological criticisms of Herbert Spencer, of Haycraft, of other far-seeing writers, were anticipated by Nietzsche ; or, rather, to be exact, that they were re-echoed by Nietzsche quite independently of their previous enunciation by Spencer. Nietzsche writes : " Granted that this struggle (the struggle for existence) takes place—and, as a matter of fact, we do witness it—it unfortunately ends generally, not as Darwin's school wish it to end, and as one might perhaps wish it with them, but rather in a contrary manner—that is to say, unfavourably for the strong, the privileged, the happy exceptions. The race does not increase in perfection ; the weaker are always victorious over the stronger, because the former have the greatest numbers, and are more cunning." ¹

To come now to some facts which support this view, we would remark that the prolongation of life, which is generally regarded—and rightly regarded—as a result of improved sanitary conditions, by no means implies an increase in the biological value of the race as a whole, or a strengthening of the constitution of the race. Professor Lexis, whose authority on statistical questions is well known, has divided the race into three categories, according to the length of life possessed by each. The first category is composed of those whose death occurs at or about seventy years of age. The second is composed of the weaklings who die shortly after birth, during the first year. The third category includes those whose death may occur at any period between the above-mentioned general limits, but which does occur, as a matter of fact, chiefly between the ages of ten and sixty ; for those children who die before attaining ten years may be classed among the weaklings who are unfit to live. Of course, accidental death is excluded. Obviously, in the natural course of things, weaklings who are born of unhealthy parents will be destroyed before attaining maturity. Measles, scarlet fever,

¹ F. Nietzsche, *Werke*, viii. 128. Leipzig, 1895.

whooping-cough, and, above all, tuberculosis, to mention only these, will claim as victims those who are weak and degenerate of constitution, whose power of resistance is least developed; and such diseases, in eliminating the unfit and thereby permitting the greater multiplication of the fit, must be regarded, in this light, as beneficial factors of race progress. Our economic conditions have disturbed the working of this law of selection; for, as Professor Lexis remarks, "the percentage of the death-rate during the first year of life is certainly very different in the different classes of the population, and is far less among the wealthy classes than among the masses. But even in the best of hygienic and economic conditions this percentage remains remarkably high, and it must be remembered that, *owing to better nursing and better food, a mere prolongation of life is attained, so that death is postponed for a few years*; whereas among the less favoured masses of the people rigorous selection operates rapidly and unchecked."¹ It is to be feared that the "rigorous selection" of which Professor Lexis speaks is unfortunately less rigorous than we might hope—even among the masses, in which natural selection must, nevertheless, necessarily play a more important rôle than among the upper classes.

The artificial prolongation of life which Professor Lexis mentions may be inferred from the statistics compiled by the Registrar-General for England and Wales concerning the death-rates at different groups of ages. In the Sixty-third Annual Report of the Registrar-General (Tables 13 and 14, p. lxii) for 1900, we find valuable comparative statistics as to these death-rates. The following is the net result of the variations from 1870-1900, omitting the intervening years, with the exception of 1880 and 1890:

¹ W. Lexis, *Abhandlungen zur Theorie der Bevölkerungs und Moralstatistik*, p. 87. Jena, 1903.

**ANNUAL DEATH-RATES AT DIFFERENT GROUPS OF AGES (1870-1900).
DEATHS PER 1,000 LIVING MALES.**

Year.	0-5.	5-10.	10-15.	15-20.	20-25.	25-35.	35-45.	45-55.	55-65.	65-75.	75.
1870	75.0	8.9	4.5	5.9	8.0	13.8	19.6	33.9	69.6	152.1	
1880	69.2	6.4	3.3	4.5	6.1	12.5	19.1	33.7	68.1	145.8	
1890	63.8	5.0	2.8	4.3	5.7	13.2	21.7	38.6	75.3	153.3	
1900	58.0	3.9	2.2	3.7	5.4	12.5	20.8	38.9	71.4	155.8	

If we come to examine these figures, we find that the rate of mortality among persons from 0 to 20 years of age has regularly and steadily diminished. On the other hand, the mortality-rate among persons of thirty-five years of age has diminished, it is true, but only from 13.8 to 12.5 in thirty years, whereas the mortality of infants under five has diminished during the same period from 75.0 to 58.0; that of children from five to ten years of age from 8.9 to 3.9; and that of children from ten to fifteen years of age from 4.5 to 2.2, or less than half. On the other hand, there has been a positive increase in the rate of mortality among persons of forty-five years of age and upwards in every category which we have considered. Whereas the mortality-rate for persons of forty-five to fifty-five years of age was 19.6 in 1870, it was 20.8 in 1900; that of persons from fifty-five to sixty-five years has increased during the same period from 33.9 to 38.9.

Among women the same phenomenon is witnessed.

The figures on p. 343 reveal the same phenomenon as the preceding ones. Among females under twenty years of age the rate of mortality has steadily and regularly diminished; whereas 64.2 per 1,000 infants under five years of age died in 1870, only 48.2 per 1,000 died during this period in 1900; the rate of mortality for infants from five to ten years of age has diminished from 8.3 to 3.9, that of children from ten to fifteen years from 4.5 to 2.4, or less than half. On the other hand, the mortality-

rate for persons of thirty-five years has only diminished from 11·9 to 9·9; while that for persons of forty-five years of age has remained stationary—15·8 and 15·6. The rate for persons of fifty-five years of age and upwards shows positive increase.

ANNUAL DEATH-RATES AT DIFFERENT GROUPS OF AGES (1870-1900).
DEATHS PER 1,000 LIVING FEMALES.

Year.	0-5.	5-10.	10-15.	15-20.	20-25.	25-35.	35-45.	45-55.	55-65.	65-75.	75.
1870	64·2	8·3	4·5	6·4	7·6	11·9	15·8	23·8	60·6	140·2	
1880	59·2	6·0	3·3	4·8	5·9	10·6	14·7	27·5	58·2	129·1	
1890	53·3	5·0	2·9	4·2	5·1	10·9	15·9	30·7	64·2	136·9	
1900	48·3	3·9	2·3	3·3	4·4	9·9	15·6	30·7	61·8	142·8	

What do all these figures teach us? In the first place, they teach us that modern sanitary improvements, modern hygiene, modern care for the child, have had a great effect in reducing the rate of child mortality; in the second place, they teach us that, on the other hand, the number of persons in the best years of manhood—from thirty-five years and upwards—who are robust and healthy is less than it formerly was. Obviously, if in 1870, among 1,000 living male persons of forty-five years of age, 19·6 on an average died; and if, thirty years later, among the same number of persons the rate of mortality was 20·8, it is evident that the average standard of life among persons of forty-five years of age has diminished. And this diminution must be taken in connection with the augmentation in the standard of life among persons of less than twenty years of age. In other words, the category of normality, as Professor Lexis would call it, consisting of those persons who attain sixty years and upwards, has seen its standard of life diminish at the expense of the category of weaklings who, in the ordinary course of events, would die in the early years of life. More weak individuals have their lives artificially prolonged through care and improved hygienic conditions; and these weak individuals, thus permitted

to attain maturity and reproduce themselves, constitute an ever growing menace to race progress. For it must be borne in mind that these weak individuals can only multiply themselves at the expense of the strong and healthy, space and food being necessarily limited. Thus, not only is a quantity of life artificially produced, which is more or less worthless to the individuals possessing it, but a quantity of useful life is actually prevented thereby from coming into being. The life of the weakling or of the invalid, who exists thanks only to the progress of hygiene, is a life which is poor in vitality, consequently a life incapable of fulfilling the elementary law of all life—that of *expansion*; for only the life which has an overflowing richness of vitality can hope to expand and to live fully in the best sense of the term. By the multiplication of weaklings the vitality and robustness of the entire race is impaired, an amount of suffering is engendered, and an amount of happiness—which has health and vitality as its primary condition—is excluded.

It has been very truly remarked that the tubercle bacillus is a friend of the human species, for it attacks no healthy man or woman, but only the feeble.¹ It is extremely probable that there is no one in the world—at least, in those countries where the bacillus exists—who has not, at some period or another of his life, had the deadly bacillus in the mouth; but the tuberculosis bacillus is deadly *only* for those whose constitution is weak or diseased. A healthy person affords no soil for the bacillus, which will be devoured by the phagocytes in the blood-stream, or otherwise destroyed. Thus, tuberculosis may be regarded, in a certain sense, as a selective agency *par excellence* which eliminates the unfit members of the race, whose constitution is pre-eminently predisposed to the cultivation of the bacillus. Children born of tuberculous parents are especially predisposed to this disease; and, as we have seen, syphilis may

¹ Haycraft, *Darwinism and Race Progress*, p. 57.

is regarded as an agent which also predisposes to it. Now, it is obviously of great value to the race as a whole that its tuberculous members should be eliminated in the early years of life, before they have attained maturity or been able to reproduce themselves. An examination of the Registrar-General's statistics will show, however, that it is precisely the mature members of society—those who have founded new families—who are becoming more and more exposed to the action of the tubercle bacillus, whereas the juvenile mortality-rate has decreased. Let us glance at the figures given us in the Sixty-third Annual Report for 1900 (p. xxxi). These figures concern only phthisis, or pulmonary tuberculosis. But this form of tuberculosis is by far the most important. Professor Albert Robin, in his report to the Permanent Commission on Tuberculosis in France, discussed in the Congress on Tuberculosis held in Paris in the autumn of 1905, states that a census has been taken in 713 towns in France, in order to establish statistics concerning the amount of tuberculosis. These 713 towns together contain 14,109,520 inhabitants. The deaths from tuberculosis are classified as follows :¹

	Total.		In 10,000 Inhabitants.	
	1901.	1902.	1901.	1902.
Pulmonary tuberculosis ..	37,697	38,085	26·7	27·0
Total number of cases of tuberculosis	45,316	45,885	32·1	32·8

It will thus be seen that pulmonary tuberculosis, or phthisis, is by far the most important form of tubercular disease. We are therefore justified in taking the Registrar-General's figures con-

¹ *Mortalité par Tuberculose en France et en Allemagne. Rapport de l. le Dr. A. Robin à la Commission permanente de la Tuberculose. Paris, 1905.*

cerning phthisis as typical of those concerning tuberculosis as a whole. Let us now look at these statistics :

MEAN ANNUAL MORTALITY FROM PHTHISIS PER 1,000,000 LIVING OF EACH SEX AT DIFFERENT GROUPS OF AGES (1890-99 AND 1900).

Ages.					Males.		Females.	
					1890-99.	1900.	1890-99.	1900.
Under	5	..	..	..	445	350	392	298
	5	..	..	..	178	131	239	198
	10	..	..	..	239	184	504	417
	15	..	..	..	1,018	876	1,329	1,059
	20	..	..	..	1,963	1,908	1,674	1,465
	35	..	..	..	3,241	3,273	2,241	2,088
	45	..	..	..	3,230	3,440	1,698	1,593
	55	..	..	..	2,703	2,838	1,296	1,216
	65	..	..	..	1,578	1,557	811	840
	75 and over	..	..	..	571	591	363	373

These figures teach us the same lesson as those previously given concerning the rate of mortality in general at different ages. Those persons most effectively protected from the results of tuberculosis—or, rather, those tuberculous persons who have most greatly benefited by modern hygiene—are precisely those under twenty years of age. Even in the short space of time under consideration the rate of juvenile mortality from tuberculosis has sunk from 445 per million to 350 per million, in the case of children under five ; from 239 per million to 184 per million for children from ten to fifteen ; and from 1,018 per million to 876 per million for young persons between fifteen and twenty. On the other hand, the rate of mortality for persons of forty-five and upwards has increased from 3,230 to 3,440 per million, and that of persons of fifty-five and upwards from 2,703 to 2,838 per million.

Thus, the net result of our modern hygienic precautions as regards tuberculosis has been this : the weak and predisposed children have been preserved in larger numbers, their life has

been artificially prolonged, they have been permitted to reach maturity and to reproduce, to the great detriment of the race as a whole. But the father of the family, the man who is already the parent of a new generation, has suffered for what the child has benefited ; and the mortality of what we may call, in physiological language, the reproductive classes has been increased by the modern care for the child.

If we consider for a moment what this means, we find that the tuberculously disposed organism has his or her life artificially preserved, and is permitted to reproduce, thus perpetuating the morbid constitution ; and the second generation, similarly protected against the natural consequences of this inherited morbid constitution, is permitted once more to multiply, and so forth. It is evident that under such a system the percentage of those who die in the best years of manhood will continuously increase, as fast as the number of those who die in early childhood decreases. It is often claimed that this better protection of childhood is a benefit for the race ; but we forget that a benefit can only be admitted if the mortality from tuberculosis *at all ages* is diminishing. At present this is not the case ; and we are protecting childhood at the expense of the race ; we are permitting weaklings to prolong artificially a useless existence, and to produce fresh generations of weaklings. A reference to the figures on p. 348 will make this clear to us.

If we glance at these two figures, it is obvious that it is to the interest of the race that the condition of affairs be such that young children of weak or diseased constitution, born of diseased parents, should be eliminated in early age—in other words, that Fig. 7 should represent the general rule. The more persons of forty-five—that is to say, of mature age—who are eliminated, the more chance is there that, previous to their elimination, they will have bequeathed their debility, if not their disease, to an enfeebled progeny. In other words, if the state of things represented by Fig. 8 be the general rule, there

is no hope of an eugenic improvement of the race ; on the contrary, under such conditions, for every single diseased person killed off there is *at least* one to take his place ; so that even supposing that tuberculous persons only had one child each, nevertheless, the elimination of the parent generation would bring no advantage ; for as fast as this generation was exterminated another would take its place. But there is no reason to limit the fertility of tuberculous parents to a single child ; and therefore, thanks to our hygienic measures for the artificial prolongation of enfeebled juvenile life, the result we achieve is the increase of the number of tuberculous persons in the community. And yet we find so eminent an authority as Sir William Broad-



FIG. 7.—CHILD UNDER FIVE ELIMINATED BY TUBERCULOSIS.

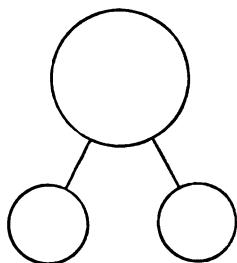


FIG. 8.—MAN OF FORTY-FIVE ELIMINATED BY TUBERCULOSIS AFTER HAVING REPRODUCED TWO OFFSPRING.

bent advocating the removal of tuberculous children from their surroundings, in accordance with the suggestions of Professor Grancher in France, in order to preserve their lives and permit them subsequently to beget new generations of weaklings. "In France," says the report of Sir William Broadbent's address, "far more attention has been paid to this question than in England, and the hospitals of Ormesson and Villepinte provided accommodation for about 500 children suffering from pulmonary tuberculosis. In England an excellent beginning had been made in the Millfield Home for children suffering from pulmonary tuberculosis, which home was under the control of the Metro-

politan Asylums Board. . . . There was great need of a home where these children could be received and given the benefit of open-air treatment. The French believed very strongly in the treatment of children in the pretuberculous stage, and we might with great advantage take a lesson from one of their latest developments, initiated by Dr. Grancher, which consisted in the removal of children from houses infected by tuberculous parents until more satisfactory conditions could be established.”¹ It is not quite easy to understand what Sir William Broadbent means, in the case before us, by the “pretuberculous stage,” seeing that a few minutes before he has spoken of “children suffering from pulmonary tuberculosis” and children certified as phthisical; and phthisis is certainly not a pretuberculous stage. But even those children who are in the pretuberculous condition, children born of tuberculous parents, are all of them *weaklings*, degenerates, in the full sense of the word, and their reproduction is not beneficial to the race.

It will be said, of course, as was said of Herbert Spencer, that we desire a return to the state of affairs which prevailed among the Spartans of old, and that, according to us, sickly, weak, and diseased offspring should be eliminated by law. Such an objection, however, would be based on a misconception. Far be it from us to desire to stop the flow of that “milk of human charity” which has done so much to alleviate pain and suffering, to bring a ray of sunlight to the outcast, to lighten the burden of many a human heart. But, above all things, we must not forget our essential solidarity with the generations which are to come; we must not forget our heavy responsibilities towards our descendants; and we must not forget that, whenever we sow the wind, those who come after will reap the whirlwind. As we have already mentioned Nietzsche, we will quote that admirable philosopher in support of this view: “We are now in a position,” wrote Nietzsche, “to under-

¹ The *Times*, December 1, 1905.

stand and knowingly to desire the realisation of that which, partly through necessity and partly through accident, has up till now been attained here and there—that is, the conditions essential to the breeding of a stronger species. We are now in a position to create the conditions under which such progress is possible. Up till now education has always had in view the advantages of society as such, *not* the possible advantages of future generations, but the actual advantages of the generations of to-day. . . . If the quantity of social force were greater, it would be possible to deduct a certain quantity of this force, which would no longer be employed in the service of the society of to-day, but which would be reserved for the benefit of future generations.”¹

The nursing and care of young children who are hereditarily predisposed to tuberculosis, or to cancer, or to any other disease, is a most necessary and excellent thing, provided we bear in mind the fact that such children should not be allowed to reproduce. In other words, care for the individual can, and, indeed, must, coexist with care for the race. The sickly and weak individual can have his life prolonged—so far there is nothing to criticise, and only a great deal of charity and kindness to praise; but this sickly and weak individual must be prevented from giving origin to a fresh crop of individuals similar to himself, if not worse. Sympathy for individual suffering must not hinder us from taking measures to prevent that suffering from being hereditarily transmitted by the reproduction of the sufferer. The greater the number of weak individuals born, the more is the amount of vitality reduced; and as the very essence of life is its full expansion, and as vitality is an essential requisite of all expansion, the multiplication of weaklings and invalids is an infraction of the most fundamental law of life.

Summing up the results arrived at in this chapter, we may say, therefore, that those who proclaim the biological degeneracy of

¹ F. Nietzsche, *Werke*, xv. 413. Leipzig, 1901.

the European races to-day are not as pessimistic as they are frequently said to be.¹ The result of the military system prevalent to-day, favouring, as it does, the biologically unfit at the expense of the biologically fit, is a grave obstacle to race progress. The multiplication of the poorest classes of the population at the expense of the higher classes, a multiplication which might be deduced *a priori* from the earlier marriage in general of the members composing the labouring classes, and which is proved *a posteriori* by statistics relating to the number of births proportionate to each class—this multiplication cannot be regarded without grave misgiving. And the general tendency of social evolution to-day, in its excessive humanitarianism, is towards the mitigation of relatively little actual suffering at the expense of much greater suffering in the future. We are not, however, to be taken as denying the amount of misery prevalent in the world to-day. Mr. W. S. Lilly, who is assuredly not given to exaggeration, tells us that those who look around them in England to-day “see agriculture ruined, the country depopulated, the towns overcrowded by ill-housed, ill-fed, and grossly sweated millions; they see everywhere the plague of pauperism side by side with the even worse plague of senseless luxury and unbridled extravagance.”² This is one side of our much-vaunted progress, the economic side. And, if we look at the biological side, we do not think that anyone will be so rash as to assert that the race, as a whole, is faring better. The systematic protection of the weak and diseased, *with permission to reproduce*, has its counterpart, in those States where compulsory military service prevails, in the systematic elimination of the fit, or in the

¹ Professor Marshall, after discussing the conditions necessary for ensuring the health and strength of the population, comes to an unexpectedly optimistic conclusion as regards the conditions prevalent to-day in Great Britain (*Principles of Economics*, p. 283). We may compare these conclusions with those which Professor Haycraft reaches in *Darwinism and Race Progress*.

² The *Times*, January 25, 1906.

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² The *Times*, January 25, 1906.

placing of obstacles in the way of their economic development. We will not here recapitulate our figures or the observations already made concerning them ; we will merely remark that some of the phenomena examined may lead to unexpected results, over and above those which can immediately be deduced from them. Thus, late marriage is a direct evil for the race, in that it lessens the degree of fertility ; but late marriage entails an increase of venereal disease, which is likewise a social danger ; and it is thus also an indirect evil. The " senseless luxury and unbridled extravagance " of which a thoughtful and earnest man like Mr. W. S. Lilly justly complains is likewise not only a direct evil ; it interferes, harmfully, with the conditions of marriage, and disturbs the normality of the marriage-rate. Largely owing to these economic conditions, women are not married on account of their physical or moral value, but because of their financial status ; and when we remember that the plutocracy, like the aristocracy, is by no means a body which is, as a whole, possessed of great physical vigour, this state of affairs must have a harmful effect on the organic value of the upper classes. In the same way, many other social phenomena must be judged not only according to the amount of harm which they entail directly ; but also by the consequences which may spring from them indirectly.

CHAPTER V

CONFLICT AND PROGRESS

I

MR. BENJAMIN KIDD, in a very remarkable work, has observed that there is in social evolution no rational sanction for progress ; and, indeed, when the observer who has previously noted the progress constantly being made in the organic realm inferior to human society casts his eye on the conditions of things prevalent in that society in its highest forms of development, he cannot fail to note the contrast which exists. In the whole realm of Nature, below man, selection works unremittingly and indefatigably, eliminating the less well adapted, ensuring the reproduction of the better adapted ; and in its less developed stages human society is as much subject to this iron law as any other part of organic nature. The state of perpetual feud and conflict at present existing between contemporaneous savage tribes in Africa helps us, if dimly, to realise the conditions of primitive man, as he slowly emerged from the brute stage, and, in face of enormous difficulties and through countless generations, made the first halting steps along the pathway of civilisation. In this primitive state of mankind natural selection is necessarily fully operative ; there are no artificial measures protecting the less fit, who are pitilessly eliminated. And the result is that a race of men and women, hardy, strong, courageous, and vigorous, is produced and constantly maintained ; for the tribe whose organic value, as made up of the biological fitness of its individual members, begins to diminish, however slightly,

is doomed to extermination. As typical of the physiological superiority attained under such conditions, we may mention the case of the Red Indian squaw who, when about to give birth to a child, while the tribe was on the march, simply concealed herself in the brushwood until her delivery was accomplished ; after which, with the new-born infant on her shoulder, she followed up the tribe, which did not delay its march. Many women must necessarily have succumbed under these conditions ; but those who survived such a test must have been the mothers of strong and healthy progeny.

In the first part of this book we have endeavoured to insist particularly on the fact that *it is selection which is responsible for all the transformations and modifications effected in the organic world*. The factors of this selection we saw to be variability, heredity, the survival of the fittest, and overfertility. It is this latter factor which is the chief source of all the progress accomplished. That the conditions of organic existence are such that a greater number of individuals are always born than can survive, gives us the key to the problem of organic progress. It is only on condition that reproduction exceed the possibilities of biological existence that competition for space and food can take place ; for if there were sufficient space and food for all the progeny of a couple, there would be no necessity for competition—each species, and each individual within a species, would find conditions favourable to its maintenance. If this were the case, transformations might take place, if the somatic modifications acquired during the lifetime of the individuals were transmitted by heredity ; but, as we have seen, such transmission of somatic characters is impossible ; and therefore transformations could only be effected by the direct influence of external factors such as climate and food. But even in this case there would be no *progress* ; the extraordinary evolution which has led from the Amœba to Man, and which has produced so many forms of life

whose complexity and beauty astonish us, would have been, at any rate, infinitely slow, and very different from what it has been. The motive for an ever-increasing complexity of detail, for the exclusion of less perfect complexes, for the ever-growing division of labour, with its accompanying perfecting of parts, would have been lacking. All this has been effected because space and food are limited, and because the numbers of organic beings brought into existence immeasurably exceed these limits. Reproduction beyond the possible conditions of existence is thus a condition essential to progress, for on this condition alone is the survival of the fittest effected. Only thus are the weak eliminated, and the stronger and more perfect preserved.

Here, then, we have the first condition of the progress alike of species and of the races and individuals within a species. It is obvious that the very idea of a survival of the fittest and the elimination of the weak implies conflict. It is through conflict alone that the fittest can be selected, because it is through conflict alone that they are afforded the chance of manifesting those qualities, physiological and psychical, which make them the fittest. And, as a matter of fact, conflict is the law of Nature. It is no exaggeration, nor is it a mere figure of speech, to say that progress is accomplished through blood. The conflict between the plants which occupy the same space; between the very blades of grass on the same plot; between the trees which form the forest, may not literally be marked in blood; but they are marked, just as much as the competition among carnivora or among human beings, by the ruthless extermination of the weaker. When we pass from the plant to the animal world, we everywhere find conflict; life persists and is maintained around us solely by conflict—conflict arising from the fundamental conditions of existence, which demand an excess of reproduction. In the animal world this conflict is often waged under conditions of peculiar complexity; it is a fight between members of the same species for food, as well as against

members of other species. The hare has to wage conflict within his own species for his food ; he has to defend himself against the wild cat, the fox, the weasel, man, and other enemies ; and he has to wage a continual conflict in regard to climatic conditions and in regard to his adaptations to these. And in all these cases the smallest favourable variation counts ; the hare whom accident has coloured more white than others will survive the rigorous winter, during which the less white hares will be more easily detected against the snow by their foes, and exterminated. Progress is accomplished precisely by the accumulation, throughout successive generations, of a vast number of small individual variations. Certainly, mutation, or the sudden modification of a large number of individuals simultaneously, under the influence of a condition affecting all in an equal degree, does take place, more especially in the plant world ; but progress in the animal world, as a general rule, is due to the accumulation of favourable individual variations, the ultimate cause of which is to be found in the struggle for existence occasioned by excessive reproduction.

The nature and extent of the conflict always prevailing in the stages of evolution below man have become so well known, as the result of the studies of Darwin and his successors, of whom Weismann is the most notable, that it is unnecessary to insist upon them here. In human society conflict is not less keen than it is elsewhere in the domain of life. Among primitive races, among the savages of to-day, even among the most highly civilised Western nations, this conflict assumes the same form of brute force pitted against brute force, of healthy and strong constitutions pitted against weak and enfeebled ones, the available food and space falling to the former at the expense of the latter. But social evolution brings other and ill-defined forces into play in this eternal conflict. Intellectual development, and also the vices which accompany it, play here a rôle necessarily absent in the other spheres of evolution. The less

evolved races dwindle away before the more evolved; not because the degree of evolution in the latter is necessarily greater, in a physiological sense, but because it is greater in other ways more directly connected with social evolution. It is true that intelligence plays a certain rôle in the conflict between the lower animals; but its sphere and its applications are much more restricted than in social evolution. The more progressive white races fatally exterminate the less progressive black races, whose lands they till and render fertile, thereby destroying the conditions under which alone these hunting or pastoral peoples can exist. Greater fertility is, in every sphere of evolution, a decisive factor in victory. The destruction of the Australian aborigines, of the New Zealand Maoris, of the Tasmanians, of the Red Indians of North America, is not due to brute force being pitted against brute force, but to those forces which attain especial importance in the field of social evolution—forces such as greater intelligence, greater capacity for reproduction, and less ability on the part of the native races to resist the vices and maladies imported by the invader. Darwin has estimated the decrease in the native population of the Sandwich Islands in the forty years between 1832 and 1872 at 68 per cent.¹ The German geographer and anthropologist, Ratzel, informs us that in 1815 the native population of Tasmania was still estimated at 5,000. In 1860 only sixteen remained, and in 1876 the race was extinct.² It is calculated that the Maoris of New Zealand, whose total number in 1858 was believed to be 53,700, were reduced to a total of 36,359 in 1872, being a decrease of nearly 33 per cent. in fourteen years.³ It is the same with the Hottentots of South Africa, with the Red Indians of North America, with all the less civilised tribes with whom Western civilisation comes into contact. And it is not necessarily the physical value of the indi-

¹ Darwin, *The Descent of Man*, p. 289.

² F. Ratzel, *Völkerkunde*, vol. ii., p. 100. Leipzig, 1887.

³ Darwin, *The Descent of Man*, p. 286.

viduals which is at fault ; man for man, the Red Indian or the Maori was probably equal in physique to the white ranchman or bushman ; but that culture brought into especial development by social evolution—greater intelligence, greater foresight, greater skill in organisation—was bound to bring success to those who possessed it.

Thus, we may safely enunciate as a law of social evolution that a race possessing social culture will be victorious in the struggle for existence over a nation devoid of social culture, the physical strength of either race being equal. But it would be a grievous error to suppose that social culture is, by itself, any guarantee of stability. Athens possessed social culture certainly unequalled by any of its rivals ; and Athens fell. The social culture of Rome, even in the degenerate days of the later Emperors, was certainly much greater than that of the Huns or the Vandals or the Goths, who possessed none ; and yet Rome fell a victim to the "Barbarians." Social culture without biological fitness is as useless as biological fitness without accompanying social culture. Thus, we may supplement the law we have stated above by saying that the race which is biologically fit and socially unfit is likely to be successful in conflict with the race which is biologically unfit and yet socially fit ; this social fitness being a survival from days in which the race was both biologically and socially evolved, for the attainment of social culture without previous biological fitness is impossible. On the other hand, the race which is biologically fit and socially unfit will be defeated and ultimately eliminated by the race possessing both biological and social culture. Thus, we may express this sociological law as follows :

1. A race which is biologically fit and socially unfit is superior, as regards the chances of victory in the immediate conflict, to a race which is socially cultured, but biologically inferior.

2. Such biological inferiority must in every case be a regression from a former condition of fitness ; for the attainment of

social culture presupposes a certain degree of biological development, and is impossible without it.

3. A race which is biologically fit and socially unfit is inferior, as regards the chances of victory in the immediate conflict, to a race which is highly developed both biologically and socially.

4. Biological fitness is to be estimated, not only by the capacity of physical endurance, but by the capacity of reproduction, by the capacity of adaptation to new conditions of social life, and by the power of resisting the importation of foreign vices and diseases.

From this point of view we may attribute the annihilation or decay of uncivilised races brought into contact with Western civilisation to both biological (eugenic) and social (traditional) inferiority.

II

The innate tendency of all life is to degenerate from a level once attained, not to advance. Life, left to itself, does not enter the path of progress, but that of regression. We see this tendency everywhere manifesting itself in the organic world. Each time an organ, or part of an organ, has ceased to be profitable to the individual, this organ or part will degenerate from its former level; and this regression sets in because selection no longer intervenes to maintain the organ in question in its previous state of efficiency. An organ or part which ceases to have biological value is withdrawn from the action of selection, which has no interest in its further conservation; and, once selection no longer intervenes, all life degenerates.

Thus, selection appears as an instrument destined to counterbalance the innate tendency of life, to prevent this tendency from manifesting itself. And, as a matter of fact, wherever this tendency of life to regression manifests itself, decay and death are the invariable result. Selection is therefore an indispensable condition of life; and, being such, we may expect to find it active

in the whole domain of organisms, from the Monera to Man. This is the case. Everywhere we find conflict and strife, and selection it is which ensures the survival of the best adapted. Life is an endless and universal strife, and all life, in order to maintain itself, must struggle, must expand, must *live fully*. The idea of expansion is implied in the idea of life; for the life which does not expand must enter the path of regression. There is nothing stationary in Nature; there is either expansion or regression. To cease to expand is to cease to live, for, as we have said, regression entails decay and death.

But cannot the human reason put an end to this state of conflict, cannot it bring about, for the higher forms of human society, a cessation of strife? The reply must be negative. Only through the medium of conflict can selection operate; and if conflict be suppressed, the action of selection is rendered impossible. What must be the result? Stagnation and consequent extinction. By the suppression of conflict human society would suppress itself.

It may be asked, Why, then, does selection operate, why is conflict the universal law of life? It is but a repetition, in other words, of the question, Why should progress be a necessity of all existence, why should life not be suffered to remain stationary, why should regression mean death? These questions the scientist cannot answer, or he can answer them very insufficiently. The conservation of the species requires the unceasing intervention of selection, we are told. This is very true; but when the biologist has told us this, he has told us very little. He has given, at the best, a secondary explanation. Here we touch on the limits of biology; and, if we wish to go further, we must cross the borderland of metaphysics, or, if we wish it, of religion. But this is not the place to examine the question, and we have merely wished to show that, if such a question is to be resolved, its solution must be sought for elsewhere than in biological science.

These considerations enable us, then, to affirm that the fundamental law of life is expansion ; the life which is best adapted to the prevailing conditions of existence is the life which contains the greatest power of expansion. In the stages of evolution which precede man, expansion stops with the expansion of the individual. The conditions of existence for the brute are such that, when its individual wants are fully satisfied, and when its reproductive needs obtain satisfaction, the fundamental laws of life are fulfilled. But as we ascend the scale of evolution, we find this expansion of the individual growing ever more complicated and ever more powerful. In the case of the primitive and prehistoric man of the caverns, when sufficient fish had been caught and sufficient prey trapped, when sufficient satisfaction had been afforded to the reproductive instinct, life had reached, for the individual, its highest degree of expansion. But even in a stage of human evolution far inferior to ours, among the savage tribes of Africa and America and Australia, we find this desire for individual expansion extending considerably beyond its primary limits. The need for expansion is no longer satisfied with the fulfilment of animal and purely individual wants. First of all, we find these tribes living, no longer isolated, but in society ; and when social existence has replaced isolated existence, the desire, as also the power, of expansion on the part of the individual becomes immeasurably increased. How it was that the isolated man of the caves succeeded in attaining to the stage of collective or tribe life does not here concern us. It suffices us to know that he did attain to it, that societies were formed, that human life did advance beyond the isolated stage. And, when the individual was no longer isolated, when he became the member of a tribe, when his individual existence became more or less bound up with the existence of a number of other individuals, then the expansion which is the fundamental law of life increased proportionately. Henceforth the life—that is to say, the faculty of expansion—of the individual

was no longer limited to the individual. We find all those elements which appertain to life in society beginning to develop themselves—customs, beliefs, regulations—all of which marked the solidarity which bound the various individuals of the tribe to each other. And all these primary institutions signified the greater expansion of individual life; they signified the commencement of what we call social life, which is an extension, an expansion, of individual life.

"No savage," says Sir John Lubbock, "is free. All over the world his daily life is regulated by a complicated, and apparently most inconvenient, set of customs as forcible as laws."¹ Herbert Spencer remarks that "advance from the lowest social groups, hardly to be called societies, to groups that are larger, or have more structure, or both, implies increased co-operation. This co-operation may be compulsory or voluntary, or it may be, and usually is, partly the one and partly the other."² Mr. Benjamin Kidd writes: "We are beginning to understand that it is these customs of savage man, strange and extraordinary as they appear to us, that in great measure take the place of the legal and moral codes which serve to hold society together and contribute to its further development in our advanced civilisation."³ Viewed from our standpoint, all these facts have the same significance: the customs of the savage, his co-operation, which increases as his social development increases, the legal and moral codes of advanced civilisation—all these are necessitated by social evolution; and the latter is but a necessary result of the conditions of existence, which demand ever-increasing expansion of life. The social group, at first small and unstable—among the Andamanese, who are limited to a strip of shore backed by impenetrable bush, forty is about the number that can find prey without going too far from their temporary

¹ Lubbock, *The Origin of Civilisation*, p. 301.

² Spencer, *Principles of Sociology*, i. 749.

³ B. Kidd, *Social Evolution*, p. 108. Macmillan.

abode—gradually acquires greater dimensions and greater stability. The primitive social group undergoes fission, breaks up into a number of separate groups ; and the conflicts of these, resulting in the extinction of some and the growth and further division of others, gradually bring about the formation of a larger society, formed by the union of a number of smaller ones. Such compound societies having been consolidated, repetition of the process on a larger scale brings doubly compound societies ; and in the course of time, after various combinations, compounding and recombining, we come to the aggregation of small feudal territories into provinces, and a subsequent aggregation of these into kingdoms. But this whole process of social growth, which is still going on before our eyes, is necessitated by the law of life, by the law of expansion. Society, since its primitive days, has done nothing but expand. As fast as society expanded and extended its limit of growth, so in proportion was the individual power of expansion augmented. And this will appear doubly clear to us when we reflect that the activity of every society is, in a sense, but the activity of its component individuals. Yet it would, we think, be a serious error to regard the social organism as a mere aggregate of individuals, and not as a body possessing its own laws, and living, to a certain extent, its own life. Our consideration of the question of suicide has illustrated how society may, even in regard to a phenomenon which at first sight appears to depend solely on the laws of individual psychology, lead an existence obeying laws *sui generis*. If we are to accept sociology as a science, then we must emphatically convince ourselves of the fact that social phenomena are not merely individual phenomena ; they are to a certain extent individual phenomena, but they are individual phenomena multiplied by x , so to speak. Thus, to take the question of suicide, we find a constancy in the rate of suicide which would be impossible were suicide a mere individual phenomenon, dependent solely on individual neurosis. Social

phenomena, as we saw clearly in regard to suicide, are phenomena which obey their own laws, which pursue their own development, and which are subject to variations due to causes *swi generis*, quite independent of the laws which govern individual psychology.¹ But the laws which govern the evolution of societies may have their repercussion on individual evolution. Thus, to take a single instance, the development of society, obeying laws of its own, may develop correspondingly the individual activities within the society.

This parallel development of social and individual activity is in reality but the twofold aspect of one and the same fundamental law governing our present phase of evolution—that of expansion. Indeed, social development has been but an increase of individual power. It was in response to the categorical imperative of expansion that the individual joined himself to other individuals; it was in order to subserve the growth of individual power that societies were formed; it is in the need for individual expansion that the origin of all social life is to be sought for. Our complex social institutions cannot be explained otherwise than by reference to this fundamental need. In the development of our industrial system we see this very clearly. The introduction of machinery, the laws preventing workingmen from combining in defence of their interests, the system which compelled women and children to exhausting labour in the factories and mines, the creation of all those innumerable ways and means, such as better lighting and quicker transport,

¹ The doctrine of "social psychology" associated with the name of Tarde has certainly a solid foundation in so far as the acts of certain men have a repercussion on society which may produce profound effects. But to say, with Tarde, that all social phenomena, such as religion, national character, etc., are the results *only* of imitation is to exclude the operation of sociological laws in the strict sense of the term. Imitation has played an incontestable *rôle* in the development of religions and of national character, but it is by no means the main factor in the development of these phenomena; and there are certain social phenomena, such as suicide, in which the part played by imitation is practically nil.

the organisation of credit systems—all these were dictated by the necessity for expansion of the industrial classes, of those classes which draw their profit from the industrial system. And, in the same way, the laws permitting trade unions ; prohibiting female and child-labour, except under certain conditions ; granting political rights to the labouring masses—these are so many acts which were compelled by the necessity which the labouring classes felt for expansion. The old system of privileges and aristocratic government had its *raison d'être* as long as the power of the labouring masses was nothing more than an inert mass, than an unconscious, and therefore negligible, factor ; but if the power of an individual can be inhibited, and can be effectually prevented from expanding, it is because of the brief span of life which individual activity has for manifesting itself in. In the case of a society, however, whose life is immeasurably longer, that expanding power must sooner or later break forth, and become irrepressible. Under the old system the life of the masses of the people was not the integral life : it was a life hemmed in on all sides by insurmountable barriers ; but as the power of the masses increased, their need of expansion increased simultaneously, and this expanding power was bound to come into conflict with the barriers which obstructed its evolution.

If this be the case, if every society has a power of expansion which, sooner or later, must manifest itself ; how is it that the inferior races have not expanded, that the negro and the aborigine have not attained to more power ? It seems to us that the reply is obvious. Every race, every society, whose power of expansion is hemmed in by barriers of artificial growth must some day come into conflict with these barriers ; and, if its expansive power be insufficient, if it be inferior to that of the race which has, up till then, held it in bondage ; the race which has just begun to expand will be thrust back in the conflict, and eventually eliminated. The expanding power of the Anda-

manese came to an end when the animal wants of the individual were exhausted ; the same holds good of all the inferior races. With them, as with the lower animals, the power of expansion is limited to the satisfaction of individual wants ; and individual wants are limited to animal wants, to the desires and needs of animal nature. That this is indeed the case is shown by the fact that these races have never expanded further, that they have never created a system of social institutions comparable to those of the superior races, that they have never felt the need of any such social expansion. Thus, we may say that the *power of expansion of a race is defined by its capacity for social evolution.*

Social evolution is not a matter of choice ; it responds to an inherent need on the part of a number of individuals who do not find in the gratification of mere animal wants any adequate satisfaction of their need of expansion ; and it takes the form which is adequate to the capacities of the race. In former days the capacities of the races of Western civilisation found adequate expression in the capacities of the governing classes. But to-day these limits are too narrow ; the rule of the once governing classes no longer satisfies the need for expansion of that civilisation. It may, indeed, be urged that the need for expansion possessed by the inferior races cannot remain contained by the barriers set up by the conquest of Western civilisation ; that, even as the expanding power of the working classes of Europe has surmounted the obstacles to its enfranchisement, that of other inferior races will do the same. But this objection is answered by the facts. The savage hordes of Africa certainly find the domination of the white man an obstacle to their need of expansion ; and the revolts of the Zulus, of the Sudanese, of the Matabeles, of the Ashantes, of the tribes of Nigeria, of the Herreros, to mention only a few, have shown that the inferior races chafe under the yoke which the white man's expansion has placed on them. But the expanding force of these inferior races, just as it is too weak to enter on the path of social evolu-

tion, is also too weak to compete with the expanding force of the superior races whose progress is expressed in Western civilisation. The profound words which Goethe puts into the mouth of Faust remain eternally true :

“ Nur der verdient sich Freiheit wie das Leben,
Der täglich sie erobern muss.”

It is always conflict that decides the fate of races, as of individuals ; and the race which does not possess the force of expansion necessary to enter on the path of social evolution must necessarily remain perpetually inferior to the race whose force of expansion has created the greatest triumphs of social evolution. The labouring masses have attained a degree of power which is adequate to their power of expansion ; they are admitted to the rights of a consultative body in all matters concerning the welfare of Western nations. But the executive power must, for the present, at any rate, remain in the hands of those better adapted for wielding it. The dark races of mankind, on the other hand, have shown the inadequacy of their expansive power to attain anything durable. Under the present conditions of existence, the law of social evolution must needs be that the societies which possess the greatest capacity for expansion will prevail in the struggle for power. And it is precisely those societies whose expansive power is greatest whose social evolution is also most greatly developed. For, as Bagehot has pointed out, the most difficult and momentous step in the history of human development has been taken by those peoples who, having, in spite of incredible difficulties, acquired a social polity, nevertheless possessed sufficient strength not to allow themselves to be subsequently retarded by this polity, necessary as it was in primitive times ; and who, breaking through the barriers set up by this polity, entered resolutely upon the path of further progress and development. Races thus capable of breaking with the past, of severing themselves from an iron polity often centuries old, must undoubtedly have been races of undeniable

biological superiority. And it is in the nature of things that such superior races should hold in bondage those inferior races who have proved themselves incapable, either of forming a polity at all, or of freeing themselves from the primitive polity once created, which acts as an insurmountable obstacle to all subsequent emancipation.

Thus, though the *need* of expansion be inherent in all races, as it is inherent in life, it can be satisfied only by those which have the *power* to effect that satisfaction. Under the actual conditions of existence the need of expansion, inherent in the very idea of life, implies conflict ; and it is through conflict that this fundamental law of life is realised. The races who are capable of the greatest expansion must infallibly realise that expansion at the expense of others less capable ; and thus, if conflict be responsible for the suffering of the vanquished, whose need of expansion is necessarily restricted ; it is responsible also for the achievements of the victors, for the triumphs of the human species, apparently so glorious.

III

When we come to look back over the road which humanity has trodden up till now, we see on all sides the wrecks of former civilisations whose sun has set, and whose glory once filled and overpowered the world. The greatest of ancient civilisations, Persia, Assyria, Egypt, Carthage, Athens, Macedonia, Rome, have gone. Athens, indeed, has left in its art and in its philosophy, an influence which will not die as long as mankind exists ; and our modern Western civilisation is strongly impregnated by that Roman culture, to which we owe our whole political and juridical science. But these vast empires have none the less disappeared in the conflict with other nations. As Mr. Benjamin Kidd says : " It is necessary to keep the mind fixed on a single feature of man's history—namely, the stress and strain under which his development proceeds. His societies, like the indi-

viduals comprising them, are to be regarded as the product of the circumstances in which they exist—the survivals of the fittest in the rivalry which is constantly in progress. . . . We watch universal paralysis and slow decay following universal dominion ; and even before the downfall of the Western Empire in 476, we see the greater part of Europe being once more slowly submerged under successive waves of more vigorous humanity. From the invasion of the Roman Empire by the Visigoths in 376, onwards for nearly seven centuries, the tide of conquest which flowed from the East and North surges backwards and forwards over Europe, making its influence felt to almost the extreme Western and Southern limits, and leaving at last, when it subsides, a new deposit of humanity overlying the peoples the invaders found in possession, who had in prehistoric times similarly superimposed themselves on still earlier peoples.”¹

It is through conflict, as we have said, that the fundamental law of life—that of expansion—is able to realise itself. And expansion is not to be understood as a mere expression of material desires. We have said, and we repeat, that just as individual and social activity advance in parallel evolution, so is social evolution the highest form of the individual desire for expansion. For the true exponent of evolutionary science ideas are not inert forms of the mind, but conscious forms of action. The individual begins to think only after he has felt and laboured. That thought is not passive, that it is the expression of our desires and of our aims, is shown by the fact that thought has always a tendency, when it has attained sufficient strength, to incarnate itself in institutions which are the active expressions of a nation’s *Wille zur Macht*, of its will of expansion. As M. Fouillée has said : “ Dans la sociologie les idées-forces sont l’expression des pensées élaborées par l’humanité entière. . . . Elles sont donc, en quelque sorte, des formes de la conscience sociale, présentes à la conscience individuelle comme le type de

¹ B. Kidd, *Social Evolution*, pp. 44, 45.

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not less certain, though it may be less obvious, elsewhere. The conditions of existence cannot really have had any rational sanction for the great mass of the people during that prolonged period when societies were developed under stress of circumstances on a military footing. . . . We can scarcely shut our eyes to the fact that the future did not concern the existing members, and that to the great mass of the people in these societies, who lived and suffered in subjection to the dominant class which a military organisation produced, the future of society, or even of the race, was a matter of perfect indifference, compared with the actual and obvious hardships of their own oppressed condition in the present." And, again, with regard to the conditions prevailing to-day in our Western civilisation, "the conclusion appears inevitable that to the great masses of the people, the so-called lower classes, . . . the conditions under which they live and work are still without any rational sanction."¹ And, further on, Mr. Kidd insists on the fact that "the teaching of reason to the individual must always be that the present time and his own interests therein are all-important to him. Yet the forces which are working out our development are primarily concerned, not with these interests of the individual, but with those of the race."²

From these considerations Mr. Kidd draws the conclusion that, if he consulted his reason only, man would put a stop to these conditions of conflict, which, if they ensure the survival of the stronger, who are a minority, do none the less ensure with equal certainty the elimination, or quasi-elimination, of the weaker or less fit, who are, after all, a majority among the population at any given moment. And Mr. Kidd believes the function of religious beliefs to be the combating of this rational tendency, for the greater good of coming generations, and of the race as a whole.

With all our admiration for Mr. Kidd's work—and he has earned the gratitude of sociological science for having been the

¹ B. Kidd, *Social Evolution*, pp. 66-69.

² *Ibid*, p. 79.

first, since Auguste Comte, to recognise the importance and validity of the religious factor in social life—we are unable entirely to follow him in his consideration of the sanctions for progress. If we admit, as Mr. Kidd does, that “the forces which are working out our development are primarily concerned, not with the interests of the individual, but with those of the race”; if, in a word, we admit that the conditions of existence are indispensable to the race as a whole, but that they injuriously affect, in a great many cases, the individual; it seems hard to understand why religious beliefs, which constitute “an ultrarational sanction for that large class of conduct in the individual when his interests and the interests of the social organism are antagonistic, and by which the former are rendered subordinate to the latter in the general interests of the evolution which the race is undergoing,”¹ should have persisted with such remarkable pertinacity throughout all the vicissitudes of social evolution; why, in other words, the individual should have striven to maintain, and should have clung to, a system whose object is to provide a sanction precisely for those conditions which adversely affect the individual as such. Finding no rational sanction for his suffering, it is not easy to see why the individual should have been at such pains to discover, all the same, an ultrarational sanction for it.

Religion does not, as Mr. Kidd most truly says, spring from the source of “pure reason”; it has its foundations deep down in the sentiments and instincts of man, in that obscure and often unconscious self which lies at the roots of our whole life. But if reason does not justify the conditions most propitious to the evolution of the race, it is hard to see why that which is deeper than reason should justify them. If the evolution which the race is undergoing is antagonistic to the interests of the individual, it is hard to conceive of the instinct of the individual, which is the ultimate source of all religious belief, seeking to

¹ B. Kidd, *Social Evolution*, p. 105.

safeguard this evolution. If a rational sanction of such conditions be impossible, why should an ultrarational sanction be sought for to cover the deficit ?

The primordial condition of life in this present phase of evolution is conflict—conflict which is necessitated by the constant tendency of organic beings to produce more life than the conditions of existence will support. This primordial condition of life is at the same time the expression of a law more fundamental still—that of expansion. Expansion begets conflict ; and this conflict is to be seen, under other forms perhaps, but with equal intensity, among the civilised races of to-day, as much as among the uncivilised races of former ages. Social evolution, as we have seen, is but the manifestation of this universal law of expansion ; individual life having reached a certain stage of development, its further expansion can no longer be confined within the narrow limits of the individual. Whether any of the primitive tribes existing to-day possess, or do not possess, religious beliefs in one shape or another is still a matter of controversy among ethnologists. But, whatever be the issue of this somewhat sterile controversy, the point which we maintain is this : *that religious belief is the outcome of the expansion of individual life, which, unable any longer to confine itself to individual limits, seeks expression in an ideal which transcends the individual.* And what holds good of religious belief holds good of social evolution generally, and of all the traditions and institutions which are the fruits of that evolution.

The white races of the West, in their irresistible expansion, have absorbed many of the inferior races, such as the Red Indians, the Maoris of New Zealand, the Aborigines of Australia and Tasmania, whose power of expansion was less effective. The same phenomenon is witnessed among the negroes of the Southern States of North America ; where, in spite of the pseudo-abolition of slavery on alleged ethical grounds, this degenerate race is dwindling before the energetic expansion of its superior

rivals. Mr. Kidd quotes, not without hesitation, Lecky's tribute to the crusade against slavery undertaken by the British race; and he still, apparently, endeavours to believe that the British race are more "humanitarian" in their dealings with inferior races than are the French, the Germans, the Russians, or any other nation. But Mr. Kidd has to admit that this humanitarianism, which is duly extolled both in and out of season as a concession to the Nonconformist conscience, has not prevented the British race from taking more than its due share in the extirpation of inferior races with which it has come into conflict or contact. The truth is that—notwithstanding the humanitarian hypocrisy peculiar to the Nonconformist conscience and the Aborigines Protection Society—the British race, by the sheer force of its expansive power, by reason of its genius for expansion, must necessarily eliminate the inferior races which stand in its way. Every superior race in history has done the same, and was obliged to do it. Nothing can be more unscientific, nothing shows a deeper ignorance of the elementary laws of social evolution, than these absurd agitations, peculiar to the British race, against the elimination of inferior races. Germany and France have been compelled to seize different parts of the African continent, and likewise to eliminate the previous inhabitants. Fortunately for these countries, neither are blessed with a Nonconformist conscience, or with an Aborigines Protection Society, and their work of colonisation and expansion can thus proceed without hindrance.

Just as expansion is a fundamental law of life, so is insatiability its corollary. And this seems to us the reason why, irrespective of rational or irrational sanction, it is impossible to alter those essential conditions on which the evolution of the race depends. The individual cannot do away with the conditions which govern the development of the race; *for in doing so he would do away with himself*. It may be replied that the labourers of to-day have no interest in working three hours a

day longer in order that future generations may obtain sixpence a day extra in wages ; or that the races eliminated in the past had no interest in allowing themselves to be suppressed at the will of an absolute monarch, as in France in the days of Louis XIV. Why did not the working classes, the oppressed classes, which constituted the overwhelming majority of the nation under Louis XIV., obey the promptings of their own interest and overthrow the régime which oppressed them ?

In the first place, we may reply, because these classes, although in the majority, had not yet attained to the consciousness of their own power of expansion. But, secondly, suppose they had reached that degree of consciousness ; if they had recognised the antagonism between their conditions of life and the régime under which they were living, what would have happened ? Precisely what did happen at the Revolution. The *ancien régime* was overthrown, and a new régime was established, the conditions of which were essentially identical with those of the old régime, the *bourgeoisie* being merely substituted for the monarchy. And such has been the result of every revolution. Each class in our Western civilisation attains its zenith ; the maxims of this class are erected into universal maxims, possessing universal validity ; but the expansive power of another class develops in its turn, and overcomes that of the once dominant class. The conditions remain the same—expansion, conflict, and insatiability.

For, let it be remarked, once a point is attained, in social as in individual evolution, that point is soon passed ; and the very attainment of it gives rise to fresh desires and fresh ambitions ; so that, as social evolution proceeds, its intensity increases by reason of this non-fulfilment of desires. Were the labouring classes of to-day to overthrow the economic system, thereby re-establishing, according to the idea of the Socialist economists, the very basis of society, this revolution would still leave human nature unaffected. Under the Socialist system expansion would be still the first necessity of the social organism ; and, if

the economic basis of society were once recast and remoulded, the recasting and remoulding would themselves become the starting-points of new desires and new ideals ; new horizons would be disclosed by the very disappearance of the old one.

Thus, though it be true in a sense that the interests of the individual are antagonistic to the interests of society as a whole ; the statement, though due to so eminent a sociologist as Mr. Kidd has shown himself to be, must, nevertheless, be qualified. The working classes of to-day, unjustly treated as they often are by the mechanism of our capitalist system of production, are unable to see that their interests coincide with the supposed interests of the race in general, and of future generations ; but, on the other hand, the conditions of life in general, as they prevail to-day—conditions which entail conflict, and much misery, and much suffering, and much cruelty—are the only possible conditions of life—at all events, if life is to continue under its present form.

To suppose that by the suppression of the economic contradictions of to-day the conditions of life will be altered, that the conflict and suffering attendant on it will be attenuated, or even abolished, is to make a grave error. Granted that life means expansion, that all life needs expansion for its very continuance, and it is obvious that the conflicts and insatiability attendant on expansion can never be abolished unless all life ceases. Science is not only convinced of the beneficence of conflict for the evolution of the race ; but she is convinced of its indispensable necessity.

The conditions under which the majority live, affirms Mr. Kidd, are devoid of rational sanction ; for the reason of the majority cannot possibly sanction the suffering of that majority, however beneficent such suffering may be to future generations ; therefore, if it were guided only by reason, the majority would alter these conditions by suppressing them. What are the conditions under which the majority live to-day ? Professor Huxley, who was

certainly not prone to exaggeration, wrote fifteen years ago that "anyone who is acquainted with the state of the population of all great industrial centres, whether in this or other countries, is aware that, amidst a large and increasing body of that population, *la misère* reigns supreme. . . . I take it to be a mere plain truth that, throughout industrial Europe, there is not a single large manufacturing city which is free from a vast mass of people whose condition is exactly that described, and from a still greater mass who, living just on the edge of the social swamp, are liable to be precipitated into it by any lack of demand for their produce. And with every addition to the population the multitude already sunk in the pit and the number of the host sliding towards it continually increase."¹ Is it to the interest of this mass thus to live, even if such conditions were to profit future generations (which we do not admit), and to benefit the evolution of society in general? But suppress the economic system which is at the basis of all this misery, decree an era of practical equality and no conflict, and what will be attained? In the long run, nothing. Human nature is stronger than any system, because it is human nature which creates that system. And human nature demands expansion; it is never satisfied; its insatiability would lead it to overthrow to-morrow the system which it erected to-day. As it must expand in order to satisfy its wants, so must conflicts surge afresh; and the new régime would soon appear to those living under it as the old régime appears to Socialist economists to-day.

The lesson which we must draw from these facts is that, if the conditions of life of the majority at any given period are in opposition to the rational dictates of that majority, and in opposition to the interests of the race as a whole; nevertheless, they are conditions from which no escape is possible; for the conditions of evolution of the race are necessarily the conditions of evolution of all human life. And, if expansion and its results, conflict and

¹ T. H. Huxley, *Social Diseases and Worse Remedies*, pp. 32, 33. 1891.

insatiability, be the law of life, these must of necessity embrace in their sphere the evolution of human life, and consequently of the human race. It follows that the interests of the majority and the interests of future generations are both included in the same conditions which govern all organic evolution. The present system may be abolished, and a new system, based on the teachings of Socialism, nay, of Anarchism, may be introduced ; but not all the artificial protection of the feeble, not all the artificial attempts to suppress the conflict which has as its result the victory of the stronger, can prevent human nature from manifesting itself. Wherever life is, there must also be expansion, and expansion implies both conflict and insatiability. So that the conflict must ever arise anew in response to new desires, which, in turn, are but forms of expansion.

And if, at any given moment, the oppressed majority do not rise in revolt and do away with the prevailing conditions of existence, this is solely because the expansive force of that majority has not attained to a sufficient degree of power to be able to cope with that of the dominant party. Certainly we are in favour of the conditions of social evolution being such, that the greatest liberty possible be afforded to all the contending forces to attain their maximum of expansion ; and our criticism of the existing state of things is based precisely on the fact that it thwarts the expansion of forces whose development would be of benefit to the social organism as a whole. But for any majority to attempt to alter the fundamental laws to which all human evolution is subject would be folly. The sanction for conflict may not be rational ; it is neither rational nor ultrarational : it is a sanction which is contained in the unalterable and fundamental conditions of existence itself.

Thus, it will appear that our view of the function of religious beliefs in social evolution is not that of Mr. Kidd. We do not regard these beliefs as an ultrarational sanction for conditions implied in the conditions of life itself—conditions whose very

sanction is *life*, since they are inseparable from life. But we thoroughly agree with Mr. Kidd as to the importance of the sociological *rôle* of religious belief ; and we think, with him, that to inform us that religious beliefs are derived from a primitive belief in ghosts and the life of the dead is to tell us nothing. Herbert Spencer's exposition of the genesis of religious belief in the first volume of his *Sociology* is, and will remain, one of the masterpieces of the human intellect ; but, nevertheless, great is the pity that Spencer did not even think it necessary, in treating of the principles of sociology, to give us any information as to the *rôle* played by religious beliefs, not only in the past, but to-day. The origin of a belief tells us nothing as to its sociological *rôle*, as to its function in social life. Mr. Kidd has filled in this lacuna in Herbert Spencer's work ; but we will glance at this important subject in a later chapter, merely remarking that, although we are unable wholly to accept Mr. Kidd's conclusions as to the nature of the social function of religious beliefs, we none the less admire the great service he has rendered in recalling this function of religion to the notice of sociologists ; who, since Auguste Comte, have been more and more inclined to neglect what is undoubtedly a most important factor in our social life.

NOTE ON OVERPOPULATION AND SOCIAL MISERY.

We have said that reproduction beyond the possible conditions of existence is essential to progress. It may, therefore, be concluded that we are in favour of unchecked multiplication of the human species ; but it is necessary here to define our meaning more explicitly.

The remarks we have already made concerning the undue multiplication of enfeebled organisms will give the clue to our position. Reproduction beyond the possible conditions of existence is essential to progress, and an indispensable condition of it, *provided free play be allowed to natural selection for eliminating the unfit elements*. Excessive reproduction is beneficial in that it provides for the action of selection. If the conditions are so altered as to allow of excessive reproduction, while diminishing the

force of the selective agencies which operate the elimination of the unfit, such excessive reproduction may become an unmixed evil.

Such, however, appears undoubtedly to be the case in Western civilisation to-day. The reproduction of the lower classes in all populous centres is certainly excessive, and is quite out of proportion to the available amount of light, space, and fresh air. If free play were allowed to those selective agencies which mercilessly operate the elimination of the unfit, such as plague, disease, drink, crime, and prostitution, we might expect to see a large reduction of the number of the biologically and socially worthless; and we might likewise expect to see a large increase of the number of the biologically and socially fit. Our civilisation is, however, constantly opposing new forces to the action of these selective agencies. Great efforts are constantly being made to combat drink, to reform the juvenile criminal, to rescue the prostitute, and to prolong the life of the tuberculous or syphilitic child; but much of this work is rendered useless by the neglect to take two measures which should form the indispensable corollary of all plans for social regeneration. These measures should be (1) to check the multiplication of biologically and morally degenerate persons; (2) to check the multiplication of the lower classes of the population as a whole.

It is doubtless an excellent thing to endeavour to reform the drunkard and the criminal, and to prolong the life of the invalid; but unless these efforts have as a corollary the checking of the reproduction of diseased elements, they must necessarily remain more or less sterile. The vice of the drunkard is cured; the youthful criminal is taught honest work, thanks to a salutary change of environment; improved therapeutics enable the tuberculous child to attain maturity—all this is admirable as far as it goes. But it must not be forgotten that if the changed social environment can sometimes exercise an influence sufficiently strong to check vicious habits and to repress anti-social tendencies—as in the case of the drunkard or the criminal—it is powerless to influence the germ-plasm; and the reformed drunkard or criminal remains physically degenerate; his bodily constitution cannot rid itself of inherent and hereditary stigmata.¹ If

¹ Of course, all hope of reforming the born criminal is vain; and it is equally vain to endeavour to make the habitual criminal an honest man. The only category of criminals whom it is possible to educate is the category of occasional criminals; but much can also be done for the children of habitual criminals by removing them from their surroundings. The classification of criminals as born criminals, habitual criminals, and occasional criminals, is that of Professor Ferri (*La Sociologie Criminelle*, Paris, 1905). It is based on the degree of predominance within each category of those specific anthropological and psychological characters peculiar to the criminal type, and which have been studied so exhaustively by Professor Lombroso in his monumental work, *L'Homme Criminel* (Paris, second edition, 1895). But if the born criminal cannot be reformed, he

we enable him to reproduce his kind, the work will have to be recommenced in the next generation, and no profit whatever will have accrued to society.

Thus, altruism, as it is practised to-day, does far more harm than good. If society is to be rid of its most undesirable elements, we must do one of two things: either we must allow free play to the action of such selective agencies as tend to eliminate unfit organisms; or, if we diminish the action of these agencies, we must take other measures with a view to ensuring an identical result. Such measures, as we have seen, consist in putting a check on reproduction. But altruism as it is practised to-day does none of these things: it diminishes the action of selection, and takes no counter-vailing measures. Its inevitable consequence must thus be an eventual increase of the diseased elements of society.

The conditions prevailing in all the populous centres of Western Europe and America to-day are such as to render exceedingly problematical any attempt to permanently reorganise the moral and material welfare of society without a preliminary check on the reproduction of the lower classes. As Professor Huxley has said, *la misère* reigns supreme among a large and ever-increasing body of the population of all great cities in Europe and America. The populous districts of large towns are an admirable recruiting-ground for plague and disease, for crime and pauperism, for drink and debauch. And the remedies which have been tried are like drops in the Pacific Ocean. One remedy alone can be efficacious, and that is to check the multiplication alike of the class which is at the bottom of the social ladder and of the still larger mass of people on the brink of the abyss, ready to fall into it at any moment if, through any unforeseen cause, there should be no demand for their produce. It is notorious that the rate of multiplication of the social classes is in inverse ratio to their value and fitness.¹ Foresight and prudence are con-

must be eliminated. It is not enough to eliminate the individual; it should be our aim to eliminate the race, and this can only be done by putting an effective check on reproduction.

Professor Maudsley has expressed the belief that when our knowledge of crime and its causes has become greater we shall be actuated by more benignant sentiments towards the criminal, whom we will consider in the light of an irresponsible person (*Responsibility in Mental Disease*, p. 35). We entirely agree that all those sentiments of hostility towards the criminal which are based on the supposition that crime is the spontaneous outcome of misguided free will are wholly irrational; and it will be the duty of criminological science to modify the metaphysical conception of free will. But we must beware of letting benignant sentiments override the necessities of social defence. If the criminal is irresponsible, he is none the less a danger for society.

¹ See above, II., Chapter IV.

spicuously lacking among the lower social classes, who multiply and reproduce themselves without the smallest regard to ultimate results.

It is evident that the *bas-fonds* of our great cities will never be cleansed so long as the rate of multiplication among the lower classes remains what it is. As things now stand, to allow free play to the action of those selective agencies of which we have spoken might result in the purchasing of ultimate benefits at too high a present price; and, in any case, such a policy would run counter to the deepest moral instincts of civilised humanity. There remains but one alternative: a check on the rate of multiplication of the lower classes. Excessive reproduction, as we have said, is indispensable under normal conditions; but there are abnormal conditions under which it may be a curse. As Professor Marshall has said: "An increase of population accompanied by an equal increase in the material sources of enjoyment and aids to production is likely to lead to a more than proportionate increase in the aggregate income of enjoyment of all kinds, provided, firstly, an adequate supply of raw produce can be obtained without great difficulty, and, secondly, there is no such overcrowding as causes physical and moral vigour to be impaired by the want of fresh air and light and of healthy and joyous recreation for the young."¹ Far from the conditions stipulated by Professor Marshall being fulfilled, the very opposite is the case. Overcrowding, with all the evils it entails—disease, immorality, drunkenness, the sapping of bodily and mental vigour—is the chief characteristic of the populous districts of every important city of Western civilisation.

And these evils will not appreciably diminish in intensity until the excessive reproduction of the lower classes is checked. The well-meaning theorist who goes to the masses and impresses on them the importance of rearing a numerous progeny is doing a mischievous work. There is a duty still more fundamental than that of the mere rearing of offspring: there is the duty of rearing offspring under such conditions as will enable that offspring to grow and flourish. This primary duty is ignored by the mass which seeks only the satisfaction of individual physical wants; and which neglects the deplorable social consequences of this thoughtless egoism.

Excessive egoism and neglect of social consequences are the results of the lack of development of social feeling among the masses; and social feeling is not developed among the mass, because the actual organisation of society is defective. Society does not control the actions of its members sufficiently, because society lacks integration. The masses are not conscious of any solidarity between their class interests and the wider interests of society as a whole. Social responsibility is an unknown factor, for the social force of the masses is too small to allow of the formation of

¹ *Principles of Economics*, p. 400.

a reserve, so to speak ; and the sense of social responsibility must have its origin in a surplus of social force which is put aside for the benefit of future generations. Here, again, we come to recognise the urgent necessity of reorganising society on the basis of principles capable of ensuring adequate social integration.

It is especially in France that an anti-Malthusian crusade has been preached in recent years. But the sociologist can have no sympathy with a crusade which endeavours to reconcile two contradicting principles : for, on the one hand, it is proposed to remedy existing evils ; and, on the other hand, the proposed remedy does but aggravate the present state of affairs. The sociologist, looking deeper into the causes that produce the degeneracy of the lower classes, has the right to say to the anti-Malthusian apostle : " In advocating increased multiplication of the masses, you are aiming unconsciously at the increase of misery under all its aspects—physiological misery, moral misery, and economic misery. You are encouraging lack of foresight and heedlessness of ultimate consequences. Your apostleship, if successful, must result in overcrowding still further districts already scandalously overcrowded ; it must deprive those already in existence of the insufficient space and fresh air which is already their lot, and it must condemn future generations to still more terrible exiguity ; its results must thus inevitably be to sap what little remains of hope and vigour among the classes which you propose to benefit." Such a crusade will not achieve social regeneration ; it will but hasten social degeneracy.

Far from advocating increased multiplication of the classes on the margin of society, we should courageously advocate abstinence. But it is entirely useless to expect this sacrifice of immediate individual happiness to ultimate social welfare until the masses are convinced of the moral necessity of such a sacrifice—until social solidarity has become something more of a reality, something more than a mere theoretical fiction. Underlying every great social problem we find a moral problem ; and at every step we are brought face to face with the imperative necessity of a suprarational principle capable of co-ordinating all the activities of the heterogeneous elements composing society, and guiding them towards the realisation of a common aim. In a society dominated by the philosophy of materialism solidarity can never be realised ; even as the individual is an aim unto himself, so must the interest of each class appear paramount, and the interest of society as a whole merely secondary. The masses who toil will never interest themselves in the welfare of society so long as the economic contradictions of our time are not rendered less flagrantly unjust ; in order to obtain from them a sacrifice on behalf of society, it is essential that they should be conscious of the fact that they are, in fact as well as in name, shareholders in that society ; and this will never be the case so long as they see unbridled extravagance and thriftlessness alongside of such physiological and moral misery as we see to-day. Volum-

tary abstinence from multiplication beyond a certain limit can alone effectually reduce this misery and promote greater happiness—physiological and moral—among the masses. But to obtain this abstinence we must reorganise our social life and our social ideals.¹

¹ Mr. Algernon Charles Swinburne, in his *Cry of the Outcasts*, has well expressed what must undoubtedly be the sentiments of those at the bottom of the social ladder when appeal is made to them to-day in the name of principles which they cannot understand; and he has given a remarkably vivid description of the state of affairs which an abnormal growth of the economic at the expense of other social factors has brought about:

“Ye, whose meat is sweet,
And your wine-cup red,
Us beneath your feet
Hunger grinds as wheat,
Grinds to make you bread.

“Ye whose night is bright
With soft rest and heat,
Clothed like day with light,
Us the naked night
Slays from street to street.

“How shall we as ye,
Though ye bid us, pray?
Though you call, can we
Hear you call, or see,
Though you show us day?”

Obviously, as long as such social conditions as these prevail all hope of social solidarity must be vain. It is equally obvious that as long as religion is not a vivifying social principle, permeating all ranks of society, exercising real and tangible influence on social life and work, it will be incapable of making itself understood of the masses of the population.

CHAPTER VI

CONCLUDING REMARKS

WE have endeavoured, in the foregoing chapters, to examine the conditions actually prevalent in society, with the object of judging of the fitness of our social state from a biological as well as from a sociological point of view. We have examined the occurrence of suicide, of insanity and alcoholism, and of syphilis, considered as social factors. We have, further, glanced at some of the conditions brought about by modern civilisation, such as militarism, the unequal birth-rate among the different classes of the population, and the general altruistic tendency of social evolution—the tendency toward an altruism which, in its anxiety to prevent a relatively small amount of necessary suffering among the living, is likely to produce an enormous amount of suffering among the generations to come. And, finally, we considered the nature of the force which underlies social evolution in general. This force Mr. Benjamin Kidd has defined as ethical; but we are inclined to consider it to be none other than the force of expansion inherent in life, which seeks ever higher and more complete expression. Of this fundamental force the religions themselves are a result.

Our considerations do not, we think, tend to justify the somewhat exaggerated optimism with which Mr. Kidd seems to regard the progress of the altruistic tendency of social evolution. Altruism plays, after all, a very limited *rôle* in modern life; but where it does enter, it has, in great measure, misunderstood its duty. Instead of seeking to extirpate diseased living genera-

tions, in the interests of the race which is to come after us, every resource of applied science is devoted to prolonging the life of weak and biologically useless persons, thus permitting their reproduction ; the result we have seen in the decrease of the rate of juvenile mortality at the expense of that of the mortality of persons of forty-five and upwards—that is to say, the result of this mistaken altruism is to permit of a greater number of persons attaining the age of marriage who, under natural conditions, would be eliminated by reason of their inherent constitutional weakness before reaching maturity. Under existing conditions these are allowed to artificially prolong their life, and to beget fresh generations of weaklings. The supposed tendency of altruistic culture—that tendency which, in the eyes of Mr. Kidd, constitutes its special value, namely, the subordination of the interests of the individual to the interests of the race—is certainly, in this concrete case, very hard to discover. Rather does it seem that altruism, in the limited sphere assigned to it, tends to preserve the useless individual at the expense of the race ; and to mitigate a relatively small amount of actual suffering at the expense of much greater suffering in the future. If Mr. Kidd were to glance at the tables of relative mortality at different ages, as given in the reports of the Registrar-General, could he maintain that the tendency of our ethical culture is to subordinate the interests of the individual to the interests of the race in the future ?¹

But are the ethical influences which Mr. Kidd sees at the basis of our Western civilisation in reality so potent as he supposes them to be ? Do they really constitute the force which is moving the civilised world ? In a remarkable chapter on “Modern

¹ “ In the process of evolution through which we have passed, the main function of that ethical movement on which our civilisation is founded has been, in the first place, to provide the sanctions necessary to secure the continued subordination of the interests of the self-assertive individual to the larger interests of society ” (*vide* Mr. Benjamin Kidd, *Social Evolution*, p. 240).

Socialism," Mr. Kidd speaks of the progress which has been effected in the conditions of the working classes during the last centuries; and he quotes statistics which show, among other things, that whereas the national debt of France has doubled from 1869 to 1881, the holders have quadrupled, and that, notably, the number of holders of small bonds tends to greatly increase.¹ This is doubtless the case. We can go further, and quote some figures relating to the distribution of wealth in England, furnished by Bernstein, the distinguished German sociologist of socialistic views, in a very interesting book, which refutes some of the errors of Karl Marx and of his orthodox disciples to-day.² In 1851, according to Bernstein, the number of families in possession of an income of £150 to £1,000 was 300,000; in 1881 the number of families in possession of incomes varying from a minimum of £150 to a maximum of £1,000 was 990,000. In Prussia, according to Bernstein, in the period from 1876-90, the number of incomes varying between £100 and £1,000 increased in the proportion of 31·52 per cent. (582,024 against 442,534). During this same period the total number of taxable persons increased only in the proportion of 20·56 per cent. The same phenomenon is witnessed in Saxony. And Bernstein concludes that "if the action and prospects of Social Democracy are dependent on the reduction of the numbers of the proprietary class, the former could comfortably disappear. But the contrary is true. The prospects of Social Democracy do not depend on the reduction, but on the increase, of social wealth." M. Paul Leroy-Beaulieu, commenting on Bernstein's criticisms, writes: "While we leave Bernstein his classifications and his qualifications, notably the qualification of *proprietor* applied to every one possessing a minimum revenue of £300, we must note that the figures which he borrows from the

¹ B Kidd, *op. cit.*, p. 226.

² E. Bernstein, *Socialisme Théorique et Socialdémocratie Pratique*, pp. 81 ff. Paris, Stock, 1900.

statistical returns concerning the income-tax in Prussia and Saxony are absolutely decisive against the thesis of Marx, which proclaims the gradual disappearance of the middle classes and the increasing pauperism of the masses."¹

But this increase of social wealth which we observe in Great Britain, in France, in Germany, and which we should doubtless notice also in the United States if we had reliable statistics to hand, need not necessarily be taken as a result of the growth of ethical influences.² Because the number of persons who are well off is proportionately greater than it was thirty years ago ; because the standard of life among the masses of the people has been raised ; it by no means follows that altruistic tendencies have therefore been at work with that degree of force and universality which Mr. Benjamin Kidd assigns to them. The increase of social wealth may, with greater probability, be ascribed to the working of forces wholly unethical in their nature ; and if we desire to ascribe this development primarily to the operation of ethical forces, we may with at least equal justice ascribe it to egoistic as to altruistic influences. For what has

¹ P. Leroy-Beaulieu, *Le Collectivisme : Examen critique du Nouveau Socialisme*, p. 480 (Paris, 4th edition, 1903). The whole of this valuable work, and especially the latter part—pp. 456-626—should be studied with careful attention.

² Nevertheless, despite the figures given by Bernstein respecting the increase of the proprietary classes in England, it remains a fact that the inequality in the distribution of wealth in that country is more pronounced than it is elsewhere. The altruistic influences of which Mr. Kidd speaks have not made themselves as yet manifest in the United Kingdom in the shape of a more equal repartition of social riches, as will be seen from the figures given below. It is incontestable, as Bernstein and Leroy-Beaulieu, and also the late Lord Goschen (*cf. Journal of the Royal Statistical Society*, 1887, pp. 581, 612), have observed, that the number of shareholders, of taxable revenues and of assurance policies, has been constantly and uninterruptedly on the increase since 1875. But this fact has not resulted in a levelling of class differences, and the alleged altruism of society in Great Britain appears to find nothing extraordinary in the economic inequalities to which the following figures bear witness.

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brought about this increase of social wealth if not competition? And can it be maintained that competition begets altruism? Mr. Kidd states very clearly that the tendency of social evolution is to increase the power and the sphere of action of those forces

the following figures for the period dating from March 31, 1889, to March 31, 1890:

Total number of successions submitted to probate duty, 46,336; representing a capital of £231,000,000.

These successions can be divided up as follows:

Amount of Fortune inherited.	Number of Successions.	Total Amount of Capital.
Under £1,000 ..	68.9 per cent. of total number of successions	£10,000,000 (7 per cent.)
£1,000 to £10,000	25.5 per cent. of total number of successions	£38,000,000 (24.8 per cent.)
£10,000 to £50,000	4.6 per cent. of total number of successions	£45,000,000 (29.5 per cent.)
Exceeding £50,000	2.0 per cent. of total number of successions	£58,000,000 (38.7 per cent.)

Thus, although the fortunes under £1,000 constitute 68.9 per cent. of the total number of fortunes inherited, the capital which they represent is but 7 per cent. of the total amount of capital, whereas the fortunes exceeding £50,000, although numbering scarcely 2 per cent. of the total number of successions, represent nearly 39 per cent. of the entire capital.

The American economist, Mulhall, calculated the following figures for the year 1899:

Total amount of revenues for the United Kingdom, £1,285,000,000.

Aristocracy: 222,000 families, average income, £1,500; total income, £330,000,000.

Middle Classes: 604,000 families, average income, £400; total income, £241,000,000.

Trading Classes: 1,220,000 families, average income, £200; total income, £244,000,000.

Working Classes: 4,774,000 families, average income £97; total income, £467,000,000.

Thus the aristocracy and the middle classes, which number together 826,000 families, possess practically half the revenues of the United Kingdom. The other half is divided up between 5,994,000 families (*vide* J. Bardoux, *Essai d'une Psychologie de l'Angleterre contemporaine*, pp. 59 ff. Paris, Alcan, 1906).

which have furthered human evolution in the past—and those forces are forces of conflict—by admitting all classes of society to competition on equal terms. We agree with Mr. Kidd as to the beneficent nature of such a tendency in our social evolution, did it exist ; but we are unable to regard it as a fact that such a tendency is predominant to-day. But even accepting Mr. Kidd's view as to the reality of this tendency of social evolution, does it not seem extraordinary to attribute the development of a tendency to increase the force and to widen the sphere of action of conflict to the growth of altruistic sentiments ? Does not this tendency to develop conflict, and to sharpen the competition of conflicting interests, spring from an increased self-assertiveness of the individual, from a growth of the egoistic feelings ?

This would, indeed, seem *a priori* to be the case. Parties or individuals, each of which is bent on obtaining the full recognition of its particular claim, are not inspired by love of the opposite party, with whose antagonistic claim they must come into conflict ; nay, more, it is only on condition that the egoistic claim be fully satisfied that the interests of a conflicting party can hope to obtain recognition. And we see this *a priori* inference to be entirely justified *a posteriori* by the facts of social evolution. The employer who, by means of a lock-out, hopes to reduce his workmen to submission ; the working man who, by a strike, hopes to bring his employer to his knees ; the speculator who, by a clever stroke, expects to enrich himself at the expense of other speculators ; the financier, the statesman who has the interests of the fatherland in his keeping, the soldier who lays down his life for *his own* fatherland—are any of these actuated by altruistic sentiments as far as their rivals or competitors are concerned ? The very idea of conflict necessarily implies the idea of a victor and of a vanquished ; and the victor can be victor, whether he intend it or not, only at the expense of the vanquished. The candidates at some competitive examination

for a particular post may bear no personal ill-will to each other ; they may not know each other personally, or they may even be personally the most intimate of friends ; and yet, as far as the competition is concerned, each one of them must have *his own* interests, and these alone, in view. Only on this condition can he hope to secure his object, which is to obtain the post in question for himself.

If we consider social evolution under its dynamic aspect, in its historical sequence, we are equally unable to see the altruistic tendencies of which Mr. Kidd speaks as the primary force which has brought about the shiftings of the balance of power at the expense of the wealthier classes. It would doubtless be agreeable to see them thus operative ; but we have to deal in a positive manner with facts. Nothing can persuade us that it was solely sympathy for the people which led the nobles and higher clergy to abandon their privileges on that historic night of August, 1791. Human nature is not a changing element ; and even as we see it to-day, so it must have been four or five hundred years ago. The nobility and the Church had nothing to gain and everything to lose by the Revolution ; and where there is no gain, but only positive loss, to be looked for, all the ethical maxims in the world will scarcely avail to make even a single individual, much less a great corporation, deliberately seek loss and prefer it to gain. True, we must not be unjust to individuals ; and there have been, notably in the ranks of the Catholic Church, a certain number of individuals who, like St. Francis of Assisi, have been wholly actuated by altruistic sentiments, and have preferred any degree of personal discomfort to enriching themselves at the expense of others. Lives such as those of St. Francis of Assisi, of St. Vincent de Paul, and others—lives shaped under the sole influence of Jesus Christ, whom they regarded as Master ; lives every minute of which was filled with the great ideal of love and pity, which was the ideal of Jesus Christ—such lives, we affirm, in themselves constitute a proof of the extraordinary influence

ich Christianity is capable of exercising. A religion which has given us St. Francis of Assisi cannot be a negligible factor in the development of human character ; and a religion capable of shaping lives of such beauty and devotion is at least worthy of something better than the contempt sometimes expressed for it by the authorised representatives of science. But let us not overestimate the importance of the softening influence which Christianity has exercised. Let us be careful not to ascribe to its influence any development the cause of which should be sought elsewhere.

The most representative form of Christianity is incontestably the Church of Rome. Exercising universal dominion, having behind her twenty centuries of glorious traditions, possessing a degree of cohesion and integration wholly unknown to the Protestant sects, the Catholic Church exercises, on the minds of those who sincerely believe in her dogmas, an influence which can hardly be estimated by those who have known her from within. The Church enjoins more strictly the practice of the altruistic virtues ; and as no Church exercises over its members an influence at all comparable in intensity to the influence exercised by this, we must take it that sincere Catholics must best manifest the result of the softening influence of Christianity. Nor be it from us to deny that there are many individuals in the Catholic Church whose conduct is thus shaped by this softening influence. But how greatly a sincere belief in the doctrines of the Church can coexist with a practical disregard of the ethical precepts of the Gospel, and also of the Church, was brought home to us lately with especial force on reading an interesting and entertaining book by M. de Mandat-Grancey on the denunciation of the religious Concordat in France. M. de Mandat-Grancey is a sincere and devoted Catholic and Royalist ; and yet we find him writing that “appliquer au gouvernement des hommes réunis en collectivité les principes de l'Évangile serait chose absolument impossible.” And he continues :

"Une nation qui essaierait de le faire tomberait tout de suite dans le chaos. Ainsi, je me faisais cette réflexion, l'autre jour à la messe, en entendant mon curé me lire la parabole du père de famille embauchant des ouvriers à différentes heures du jour, de sorte que les uns font une journée entière, les autres une demie, et les derniers ne travaillent qu'une heure. Après quoi, il les paie tous le même prix, répondant à ceux qui se plaignent, qu'il a bien le droit de le faire, puisqu'il paie à tous la journée entière. Cela est très vrai ; et cette parabole est admirable tant qu'on l'applique aux choses spirituelles, comme l'a fait Notre Seigneur ; puisqu'elle nous enseigne qu'il ne faut jamais désespérer du bonheur éternel. Mais qu'aviendrait-il si l'on applique de pareils principes aux choses de ce monde ? Supposons qu'on le fasse ! On néglige de nous dire ce qui est arrivé le lendemain à ce père de famille ; il est clair qu'il n'a pas pu trouver un seul ouvrier consentant à travailler plus d'une heure ; et si cette belle idée lui a pris au moment de la vendange il faudrait savoir à combien son vin est revenu. Il en est de même du conseil qu'on nous donne de tendre immédiatement la joue gauche, si quelqu'un s'avise de nous donner un soufflet sur la droite. Un pareil régime ne profiterait qu'aux escarpes et aux Apaches ; car il faut bien se dire que, dans toute agglomération humaine, il y a toujours eu, et il y aura toujours des gens très disposés à souffleter leurs voisins ; et d'autres qui ne demandent qu'à vivre en paix avec tout le monde. Si, par respect pour les préceptes de l'Évangile, les seconds se laissent souffleter par les premiers sans mot dire, ce seront ceux-ci qui seront les maîtres du pays ; et ce pays ne sera bientôt plus habitable, parcequ'on y aura trop pratiqué les vertus évangéliques."¹

We have no intention of quoting M. de Grancey as an erudite authority ; but it cannot be denied that in the above passage he expresses a view which is only the plainest common sense. And this is the view of a man who is one of the most devoted of Catholics, from whom, consequently, one might expect to have had an expression of a diametrically contrary view.

Leaving M. de Grancey, let us take the most obvious facts of our Western civilisation, as they present themselves to us to-day ; assuming that what holds good of our civilisation to-day held good for the civilisation of the era of the French Revolution, and for that of the era of the Reformation. For our Western civilisation to-day is confessedly based on Christian principles. It is

¹ E. de Mandat-Grancey, *Le Clergé français et le Concordat*, pp. 190, 191. Paris, Perrin, 1906.

true that the French Republic has abandoned this position, and officially ignores all religion ; but France cannot be reckoned an exception to the general rule, for she is still largely permeated by Catholicism ; and, as Mr. Kidd most rightly says, the ethical creed of those who profess themselves hostile to Christianity is none the less derived from the ethics of Christianity. What we look for to-day is the proof that the forces which are working in our Western civilisation are being shaped by the softening influence of the ethics of Christian altruism.

In the domain of international politics what do we see ? A gigantic war in the Far East has but recently been brought to a conclusion ; and this war was the result of the expansion of two peoples, and of the consequent clash of their antagonistic claims. Storm-clouds are to be seen in the Balkan Peninsula and in Morocco, not less than in the Far East, which is still smouldering, and from whence proceed rumours of Chinese hostility to Europeans. But Macedonia and Morocco are but incidents, pawns in a greater game. This greater game is the struggle for European hegemony which looms perpetually on the horizon. The whole history of Europe during the nineteenth century has been summed up in this never-ceasing struggle for hegemony amongst the Western peoples. For a period it was Napoleon who realised this dream, and whose standards floated from the Bidassoa to Moscow. But the coalition of those whom he had subjugated with Great Britain, which he had not subjugated, succeeded in overthrowing the power of Napoleon. Since 1806, when Prussia was annihilated at Jena and humiliated at Tilsit, a new force has been growing ; at first silently, in the lecture-halls of the Universities and in the class-rooms of the schools ; and subsequently, with ever-increasing clamour, on the field of battle. This new Power is none other than Prussia herself, rejuvenated after Jena and Tilsit. The defeat of Denmark, and the seizure of the provinces of Schleswig-Holstein ; the overthrow of Austria

in 1866 ; the crushing of the French Empire in 1871 ; the unity of all the German States in a confederation of which Prussia is the heart and soul ; and the whole policy which, during the last thirty years, has aimed at securing for Germany the predominant part in the counsels of the Sultan, which has aimed at the isolation of France and England, which has aimed at developing, in a word, the *Weltpolitik* of Germany—all these are but so many steps in a road, the end of which is intended by German statesmen to be the domination of Germany in Europe.¹

But even this question of the hegemony of a single Power in Europe is not the ultimate question confronting international politics. There is the question, greater still, of the *rôle* of North America in the world ; and those who foresee an economic absorption of the international markets by the United States are perhaps not altogether wrong. Certain it is that the economic conflict between the New World and the Old is a problem of ever-increasing importance. And behind even this question as to the hegemony among the white races comes the still more far-reaching question as to the relative positions of the white and yellow races. Up till now it has been the white races which

¹ We do not mean to express any condemnation of German policy. Nothing can be more extraordinary than the attitude of the anti-German Press in England with regard to German Imperialism ; and those who bear in mind the record of Great Britain will certainly attach very little importance to more or less sincere comments on "German perfidy" and "German aggression." From a more scientific, and consequently a calmer, point of view, Imperialism and militarism are in every country the results of that fundamental need of expansion on which we have dwelt in the last chapter. It is scarcely fitting that the most aggressive country in Europe, which is periodically subject to war-fevers, should reproach Germany for wishing to expand. During the last thirty years, besides the innumerable colonial and frontier wars in Africa and India, England has twice menaced the peace of Europe—in 1878, at the time of the Berlin Conference, and in 1898, at the time of the Fashoda incident ; she has conquered Egypt, and placed it under her domination ; and she has destroyed the South African Republics. With such a war-stained record, the English Press would do well not to insist too much on the "Jingoism" of other countries.

have dominated the world—at least, for a period of nearly 3,000 years. Civilisation, as we know it, has been the work of these races ; and it was the custom, up till very recently, to look down with indiscriminating contempt on every race of different origin. But now emerges a new factor in *Weltpolitik* ; a new civilisation, entirely different in some of its ethics to our own, has entered the ranks of the Powers ; and the triumph of Japan over Russia may not impossibly be but the prelude to the more extensive triumph of the yellow races over the white, of the East over the West. Thus, the area of international conflict has a tendency to become ever wider. We are no longer confronted with the sole question of European hegemony. Behind the question of the internecine conflicts of European Powers stands the larger question of the conflict between the two great civilisations which the white races have founded—between the new and progressive civilisation of the United States and the old and time-honoured civilisation of Europe ; and behind this question of the ultimate hegemony among the white races in general stands the largest question of all—that of the hegemony of the world.

We have been so accustomed up till now to use the word “domination” as synonymous with the words “white race” that it may be some time before we fully realise the possibilities opened out by the awakening of the East. The first of all great civilisations known to us—that of Athens—was a civilisation of the white race ; the hegemony which Rome established was the hegemony of a white race ; and after the tremendous upheavals which marked the decline and fall of the Cæsars ; after a new strata of inhabitants, borne in by the stream of invasion from Asia, had established itself firmly upon the ruins of the ancient peoples, a new civilisation sprang into being, which was essentially the civilisation of the white races. The dogmatic origin of Christianity does not here concern us : it may be Asiatic or Egyptian in its origin ; but the political development of

Christianity, as we know it from the time of Constantine onwards, as it has saturated Europe, is entirely the work of the white races. It was the Pope who sent forth the Crusades against the Turk ; it was under the auspices of the Holy See that the invasion of the Arabs was checked ; it was at the bidding of the Vicar of Christ that the invader from Africa was beaten back from the shores of Europe, and Iberia reconquered ; it was, again, under the auspices of Papal Christianity that Columbus sailed in search of new lands and discovered the New World ; it was Christianity, as represented by the Roman See, which conquered the whole southern portion of the continent, from Panama to Cape Horn, and which divided this new continent between Portugal and Spain. And, further, it was in the sanctuaries of the Church that the flame of learning was kept alight throughout the darkness of the Middle Ages ; it was the Church which, exercising her right of universal spiritual dominion, divided up Europe into States, and laid the foundation of the modern world as we know it. But it is not only from the political point of view, but more especially from the *social* point of view, that the Church must be regarded as having laid the foundations of modern civilisation ; and as having brought about those essential conditions without which the latter could not have been realised, or would have been indefinitely retarded. The ages in which Papal Christianity dominated Europe are often regarded as the ages of ignorance and darkness ; but it is remarkable to note the high tribute paid by Auguste Comte, the founder of a system of philosophy destined, in the mind of its author, to be entirely divested of all Catholic and metaphysical conceptions, to the work of the Church—as a social factor during the Middle Ages ; it is remarkable to find the founder of the Positivist School seeking the origin of all our present social developments in the work of the Church. It is well to remember with regard precisely to that theological philosophy of the Middle Ages which modern scientists, regarding it from a modern standpoint,

wrongly judge to be contemptible—it is well to remember, we say, what the founder of the Positivist School said of it :

“ A cette seule philosophie,” wrote Auguste Comte, “ il appartenait, en vertu de son admirable spontanéité caractéristique, de dégager réellement l'esprit humain du cercle vicieux où il paraissait d'abord irrévocablement enchaîné, entre les deux nécessités opposées également impérieuses, d'observer préalablement pour parvenir à des conceptions convenables, et de concevoir d'abord des théories quelconques pour entreprendre avec efficacité des observations suivies.”¹

Further on, Comte notes the social consequences which future developments have derived from this theological domination :

“ Il faut,” remarks Comte, “ apprécier convenablement, sous deux points de vue principaux, la haute destination sociale de la philosophie théologique, soit pour présider d'abord à l'organisation fondamentale de la société, soit ensuite pour y permettre l'existence permanente d'une classe spéculative. Sous le premier aspect, on doit reconnaître que la formation de toute société réelle, susceptible de consistance et de durée, suppose nécessairement, d'une manière continue, l'influence prépondérante d'un certain système préalable d'opinions communes, propre à contenir suffisamment l'impétueux essor naturel des divergences individuelles. . . . Mais, d'un autre côté, on ne peut nier d'avantage que l'esprit humain, dont la préalable activité doit fournir cette base première de l'organisation sociale, ne soit, à son tour, exclusivement développable que par la société elle-même, dont l'essor est réellement inséparable de celui de l'intelligence. . . . Voilà donc, sous un nouvel aspect, l'humanité, à son origine, encore enchaînée politiquement, comme elle l'était déjà logiquement, dans un cercle radicalement vicieux, par l'opposition totale de deux nécessités également irrésistibles. Or, à ce second titre, aussi bien qu'au premier, la seule issue possible résulte alors, évidemment, de l'admirable spontanéité qui caractérise la philosophie théologique. . . . Outre cette haute attribution sociale, la prépondérance primitive de la philosophie théologique a été politiquement indispensable au développement intellectuel de l'humanité sous un autre aspect général, comme pouvant seule instituer, au sein de la société, une classe spéciale régulièrement consacrée à l'activité spéculative.”²

This quotation from Auguste Comte is not unnecessary ; for it shows that the founder of the Positivist School, than whom

¹ Auguste Comte, *Cours de Philosophie Positive*, iv. 533. Paris, 5th edition, 1893.

² *Ibid.*, iv. 542-545.

no one was better qualified by his studies on the subject, fully recognised the indispensable character of the rôle played by the theological philosophy in the origin of our civilisation ; and this theological philosophy was placed under the auspices of the Church ; so that we may say it was under the auspices of the Church that the conditions necessary to the subsequent development of Western society were realised. And elsewhere Comte speaks of "cette économie générale du système catholique au moyen-âge, que l'on devra concevoir de plus en plus comme formant jusqu'ici le chef-d'œuvre politique de la sagesse humaine."¹ So that we may conclude that Western civilisation in its expansion beyond Europe, as in its social and political organisation, is the work of Papal Christianity.

But Christianity is essentially, in its development since the time of Constantine, the work of the white races ; and the expansion of the white races, carried on under the auspices of Christianity, knew no limits. Asia, Africa, the two Americas, Australasia, have been brought under the influence of these races, if not wholly absorbed by them. And thus, as our social and political evolution, and our expansion in all corners of the globe, are primarily due to a factor which for ten centuries represented the power of the white races against the Turk, the Moor, or the Indian ; it is but natural that the belief should have been engendered that outside Christianity and the white races no civilisation was possible.

This seems to be the belief of Mr. Kidd. But since Mr. Kidd's admirable book on *Social Evolution* was published, the other factor to which we have alluded—namely, the yellow race—has come into prominence, and stepped into the ranks of the Powers of the world. And this phenomenon not only shows that the area of human conflict tends to expand in correlation with the ever-growing expansion of the sphere of human activity ; it

¹ Auguste Comte, *Cours de Philosophie Positive*, v. 261. Paris, 5th edition, 1893.



shows us also that Christianity and the ethical influences with which it is associated are not universally essential to the development of civilisation. And if this be the case—if efficiency in that domain of evolution which we characterise as Western civilisation can be attained independently of the ethical influence of Christianity—there is at least a strong presumption that such efficiency was likewise attained in Europe and America independently of these ethical influences. For we must distinguish between the influence exercised by Christianity as a vast political system on the formation of our institutions and on our whole social organisation; and the supposed *ethical* influences of Christianity, which Mr. Kidd takes to be the primary force underlying social evolution in Western civilisation.

In the domain of international politics, then, the tendency of evolution is towards a continual widening of the sphere of conflict. Let us turn to the domain of social questions, using the phrase in the restricted sense to mean the Social Question, the question of the relation of capital to labour. Mr. Kidd has insisted upon the alleged tendency of social evolution to give to all classes of the population an ever-increasing chance in the struggle for existence. But, while fully admitting the beneficence of a tendency to widen the sphere of social competition by allowing an ever greater number of individuals to enter it—at present large numbers are hereditarily excluded from the sphere of competition properly so called, seeing that they get no chance of even entering upon the struggle, but are condemned from birth to submit to certain degrading conditions—we are unable to see this tendency really at work. True, there has been a shifting of the balance of power at the expense of the wealthier classes; there has been some levelling of wealth, and a more equable distribution of social riches.¹ This shifting of

¹ The repartition of social wealth is more equable in Germany and France than in Great Britain; as we have seen, the inequalities in Great Britain are extremely marked.

surer, what harbour can be calmer or more protected against the fury of the ocean storms than death? Suicide is thus the logical termination of a life of disappointments, unsupported by a higher and supra-individual force. And, assuredly, it is not for us to cast a stone at the tired traveller who does but seek a rest from the storms of the violence of which, perhaps, only he alone is fully aware! Our task is not here a moral, but a scientific one. Suicide is a social phenomenon which obeys certain laws; and it is the duty of the sociologist to investigate these laws with a view to curing the disease.

But if the individual be not one of the vanquished in life's conflict—in life's unequal conflict—the result may be the same. The successful individual has raised himself to a material situation formerly unknown to him; he has now the power to gratify desires which formerly may have seemed to him senseless Utopias. But, once again, he has raised himself by his own power; he is consequently accustomed to consider that individual power sufficient to satisfy all his wants; he is accustomed, more than ever, to prize the doctrine of individualism, because he sees in his own individual strength the source of all his increased power. But it is not long before he is disillusioned. In proportion as his desires are gratified, new desires arise. As we said in the previous chapter, if the individual contains within his own constitution the principle of insatiability, he does not contain within himself the principle which can afford satisfaction amid this everlasting *Drang*; and at last, realising this fact, the successful individual realises that every unfulfilled desire involves a state of positive suffering, and, as his ultimate desires must always remain unfulfilled, his suffering knows no end. He is not held back by any link which binds him to society at large, by any link of communion with his fellow-men; his life appears to him empty, his efforts seem but vain. Here again is suicide the logical termination of a life which is uncontrolled by any supra-individual ideal. For the successful individual, as well

as the vanquished, must needs ask himself at one moment or another, "Whither leads this path?" Detached from everything, thrown back on his own resources, he sees no aim to his *Streben*, no tangible result to his efforts—for as fast as the old desires are satisfied new desires arise—and life must needs appear to him as valueless. Suicide is resorted to when life no longer possesses any value; and life can possess value only if satisfaction be afforded to our fundamental need for expansion. Individualism affords no such satisfaction; and with the growth of individualism the rate of suicide must undergo a corresponding increase. Here once more we have an *a priori* inference which is justified by the facts ascertained *a posteriori*.

But if this be the case—if this *a priori* inference be indeed justified by the facts ascertained *a posteriori*—how does this affect the thesis of Mr. Kidd, that the primary force shaping the development of our Western civilisation is to be sought in the effect produced on us by the ethical teaching of Christianity? Does it not show that, not the gentle altruism of the Sermon on the Mount, but unbridled egoism, dominates the greater part of our social life to-day? True, as we have seen, altruism does tend to play a *rôle* in our social evolution; but, unfortunately, it has misunderstood its *rôle*, and, even in this misunderstood *rôle*, its influence is strictly limited to a very narrow sphere. Outside this sphere the conflict rages; and our economic conditions are not those most propitious to the waging of this conflict. But, be that as it may, conflict is in itself necessary to human progress; and the very notion of conflict, the very notion of the survival of the fittest, is essentially non-altruistic; so that to preach the necessity of conflict and the beneficence of altruism at one and the same time is not quite consistent.

It may be objected that suicide, like crime, is a normal feature of social life, since it is constant; and that it rids the social organism of a number of useless members. That suicide does, to a certain extent, operate thus as a selective factor is incontest-

able ; but the fact remains none the less that a large amount of suicide is due, not to the bio-social unfitness of the individual, but to the unnatural conditions in which that individual is placed ; for, be it remarked, a large proportion of suicides occur precisely among those who have been successful in the struggle ; and whose premature removal, which constitutes a loss for society, is due to that disgust for life which is engendered by the impossibility of satisfying in an adequate manner the fundamental desire of all life—that of expansion.

We may sum up, therefore, by saying that the steady increase in the rate of suicide everywhere indicates that individualistic, and not altruistic, influences are to-day predominant ; and that individualism is an essential factor, if the primordial conditions of human evolution are to be fulfilled in the future. But, starting from this standpoint as to the necessity of individualism, our study of certain phenomena of social pathology has led us to the conclusion that *the conflict so necessary to progress is not being waged under the conditions most likely to ensure benefit to the race*. And we will come to the further conclusion that, although altruistic influences are not the primary force determining social evolution, yet *the religion of which these altruistic influences form the chief part is an indispensable factor in social development*, because it alone is in a position to satisfy the *supra-social* wants of man, to respond adequately to that need for expansion which transcends society itself.

NOTE ON PROSPECTIVE CONFLICTS IN EUROPE.

The most instructive example of the truth of our remarks concerning the importance of conflict in social evolution is afforded us by Russia. In Russia we can see the law of national expansion—which is but an extension in space and time of the law of individual expansion—at work ; we witness the intellectual turmoil, the conflict of antagonistic ideas, which this expansion brings necessarily in its train ; and we witness also that physical struggle which is the most brutal manifestation of the opposition of interests which results from the expansion of numerous hetero-

us elements. The new régime inaugurated by the Imperial Ukase of October 30, 1905, was, indeed, preceded by the most violent physical struggles—by war against the foreign foe and by revolution at home; if physical struggle was the immediate cause of the Ukase of October 30, that physical struggle was itself prepared by the intellectual soil produced by half a century's slow expansion. Ideas are not mere and abstract forms of the mind; they are, as M. Fouillée has said, among the most powerful factors in social development and evolution.¹ Professor Kovalewsky rightly remarks that "we cannot regard the present hour as anything else but the departure-point of a new phase in the evolution. The limits which Auguste Comte artificially imposed on humanity, the limits of Western Europe, have been extended, and the notion of progress, which is fundamental in sociology, can henceforth be applied, not only to the evolution of the Latin and Germanic peoples, but to the whole of humanity."²

The intellectual conflict which originated in the Renaissance, and which, in the countries of Western Europe, has caused ever-growing fermentences of thought, has now crossed the frontier which it seemed destined never to cross. The Slav races, sunk in a seemingly hopeless torpor, have awakened to fresh life and vigour at the contact of Western civilisation. The agreement of the ignorant which characterises ages of mental apathy has been replaced, to a considerable extent, by the agreement of the thoughtful which characterises ages of intellectual activity. During many years the seed has been maturing, and now it is ripe. The awakening of Russia, however impossible such an event might have seemed even to the genial mind of Comte, was inevitable; for expansion be the law of life, how could 120 millions of human beings be condemned to vegetate eternally? The awakening of Russia, like the awakening of Japan, like the prodigious expansion of the United States, is a sociological event of the greatest moment; for it foreshadows a mighty conflict, of which we have not previously spoken, but which appears inevitable and fraught with danger for European civilisation—the conflict, namely, between the Slav and Germanic races for the ultimate hegemony of Europe. The triumph of the former would imply a great danger for European civilisation; for the Slav is not a European: he is an Asiatic in core, and he has always lived outside the pale of European culture and tradition.

See the excellent remarks of Professor Marshall on the reality of ideas in *Principles of Economics*, p. 104.

Revue Internationale de Sociologie, vol. xv., No. 1. Professor Kovalewsky draws attention to the spread of the "intellectual conflict" to the Mohammedan countries. A national assembly now sits at Teheran, and Turkey is also agitated by demands for constitutional government.

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The intellectual conflict which originated in the Renaissance, and which, in the countries of Western Europe, has caused ever-growing fermentations of thought, has now crossed the frontier which it seemed destined never to cross. The Slav races, sunk in a seemingly hopeless stagnation, have awakened to fresh life and vigour at the contact of Western civilisation. The agreement of the ignorant which characterises ages of mental apathy has been replaced, to a considerable extent, by the ferment of the thoughtful which characterises ages of intellectual activity. During many years the seed has been maturing, and now it is ripe. The awakening of Russia, however impossible such an event may have seemed even to the genial mind of Comte, was inevitable; for it is the law of life, how could 120 millions of human beings be condemned to vegetate eternally? The awakening of Russia, like the awakening of Japan, like the prodigious expansion of the United States, is a sociological event of the greatest moment; for it foreshadows a mighty contest, of which we have not previously spoken, but which appears inevitable and fraught with danger for European civilisation—the conflict, namely, between the Slav and Germanic races for the ultimate hegemony of Europe. The triumph of the former would imply a great danger for European civilisation; for the Slav is not a European: he is an Asiatic in core, and he has always lived outside the pale of European culture and tradition.

See the excellent remarks of Professor Marshall on the reality of ideas in *Principles of Economics*, p. 104.

Revue Internationale de Sociologie, vol. xv., No. 1. Professor Kovalewsky draws attention to the spread of the "intellectual conflict" to Mohammedan countries. A national assembly now sits at Teheran, and Turkey is also agitated by demands for constitutional government.

able ; but the fact remains none the less that a large amount of suicide is due, not to the bio-social unfitness of the individual, but to the unnatural conditions in which that individual is placed ; for, be it remarked, a large proportion of suicides occur precisely among those who have been successful in the struggle ; and whose premature removal, which constitutes a loss for society, is due to that disgust for life which is engendered by the impossibility of satisfying in an adequate manner the fundamental desire of all life—that of expansion.

We may sum up, therefore, by saying that the steady increase in the rate of suicide everywhere indicates that individualistic, and not altruistic, influences are to-day predominant ; and that individualism is an essential factor, if the primordial conditions of human evolution are to be fulfilled in the future. But, starting from this standpoint as to the necessity of individualism, our study of certain phenomena of social pathology has led us to the conclusion that *the conflict so necessary to progress is not being waged under the conditions most likely to ensure benefit to the race.* And we will come to the further conclusion that, although altruistic influences are not the primary force determining social evolution, yet *the religion of which these altruistic influences form the chief part is an indispensable factor in social development,* because it alone is in a position to satisfy the *supra-social* wants of man, to respond adequately to that need for expansion which transcends society itself.

NOTE ON PROSPECTIVE CONFLICTS IN EUROPE.

The most instructive example of the truth of our remarks concerning the importance of conflict in social evolution is afforded us by Russia. In Russia we can see the law of national expansion—which is but an extension in space and time of the law of individual expansion—at work ; we witness the intellectual turmoil, the conflict of antagonistic ideas, which this expansion brings necessarily in its train ; and we witness also that physical struggle which is the most brutal manifestation of the opposition of interests which results from the expansion of numerous hetero-

geneous elements. The new régime inaugurated by the Imperial Ukase of October 30, 1905, was, indeed, preceded by the most violent physical struggles—by war against the foreign foe and by revolution at home; but if physical struggle was the immediate cause of the Ukase of October 30, that physical struggle was itself prepared by the intellectual turmoil produced by half a century's slow expansion. Ideas are not inert and abstract forms of the mind; they are, as M. Fouillée has said, among the most powerful factors in social development and evolution.¹

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The duty of English statesmen would thus be to attach less importance than they do to immediate accidental combinations; and more importance to ultimate contingencies in the future. Alliances with Japan, understandings with France, cordialities with the United States, may serve an immediate accidental interest of England. But the party which aims at making such temporary and accidental combinations the corner-stone of British foreign policy would appear to be dangerously short-sighted. The Japanese statesman who cleverly contracted the British alliance served thereby the best interests of their country; for they had in view the conflict with Russia and the probability of European intervention, as in the war with China in 1895; and they saw in the British alliance the best means of preventing any such intervention. But what constitutes the interest of Japan does not necessarily constitute the interest of England. The "yellow peril" is much derided in England. But what is the yellow peril if not the expansion of the yellow races, expansion which, owing to the vast numerical superiority of the latter, would constitute a terrible danger for European civilisation?¹ The argument that China will never expand is futile. What justification is there for this prophecy? Who could have foretold in 1850 the astonishing expansion of Japan? And would not Comte himself have refused to believe in the reality of such an event as the Ukase of October 30, 1905, with all its possible consequences for Russia and the world? Arguments based exclusively on prophecy are always weak; and, in the present instance, the prophecy of those who maintain that China will never stir, examined by the only light we can examine it in—that of analogy—is found to be devoid of all value.

The same reason which appears to us to condemn, from the point of view of the national interest of England, the alliance with Japan; appears to us to condemn also the policy, now so much in favour, of hostility to Germany. Even as an accidental interest may have been served by the alliance with Japan—though what this interest was, or is, does not seem clear—so an accidental interest may be served by a policy of hostility to Germany; though here again we are wholly unable to discern the interest which it proposed to serve thereby. But, in the one case, the ultimate contingency of a vast conflict between the white and yellow races for the domination of the world is complacently overlooked and relegated to the domain of fiction; and, in the other, the ultimate contingency of a conflict between the Slav and Germanic races for hegemony in Europe is similarly overlooked. We have spoken in the last chapter of the policy of Germany

¹ The incident which has recently occurred (December, 1906) between Japan and the United States with regard to the exclusion of Japanese children from State schools in California, is pregnant with meaning. The Californians are in a position to appreciate the ultimate consequences of excessive Japanese immigration.

as being dominated by the desire of Continental hegemony ; and, indeed, this spectre of German domination on the Continent of Europe haunts the minds of most Englishmen to such an extent that the idea of an Anglo-Russian alliance is fast becoming familiar. But, lest we be misunderstood, it is, perhaps, as well if we explain our meaning a little more fully.

The situation in Europe can be understood only if the nature of the developmental forces working out the evolution of the European peoples are properly grasped. One great fact dominates all the others—the struggle between the Slav and Germanic races for supremacy in Europe. All minor developments are but incidental occurrences of only temporary moment. The policy of Germany since 1871 has been shaped in view of this ultimate contingency ; the efforts of German statesmen to secure the predominance of Germany in Europe have all had the same reason—the necessity of opposing a strong and extended Germany to the advance of the Slav. Whether it be the result of reasoning or instinct, certain it is that the German people have been able to appreciate the reality of the situation. They have understood that Russia will not, and cannot, remain eternally confined within her present boundaries ; that there is an unknown and enormous reserve of strength and energy in the Russian Colossus ; that the Pan-Slav agitation, with its dreams of universal conquest, does but anticipate a racial demand. They have seen Russia advance, slowly and steadily, in the Far East, in Persia, towards the Dardanelles ; they have witnessed the revival of separatist agitation in Prussian and Austrian Poland ; and now they contemplate the gradual awakening of 120,000,000 Russians who live between the White and the Black Seas, between the Urals and the Vistula. Having this perpetual menace before them, German statesmen have sought to prepare the German people for a struggle which they know to be inevitable. The struggle will be, not only between Russian and German, but between Slav and Teuton ; and Germany will be—as is only natural—the Continental centre of a confederation of the Germanic peoples which will embrace German Austria, German Switzerland, Scandinavia, Denmark, Holland ; and which ought certainly to embrace Great Britain.

We maintain, therefore, that any efforts which have been made to secure the Continental predominance of Germany were not contrary to England's interest ; but that such efforts should have been seconded by England, in view of the ultimate contingency of a conflict between the Slav and Germanic races.

Even as hostility to Germany appears contrary to England's interest, so does an alliance with France appear to be based on a very short-sighted appreciation of facts ; and far more does the project of an Anglo-Russian alliance seem, alike from an English and from a Russian point of view, entirely senseless. The importance attributed to-day to the action of

France is due far more to reminiscences of the past than to comprehension of the present. A nation whose population, in spite of all efforts, remains stationary; which is divided by internal dissension, brought about by anti-clerical fanaticism; which is being slowly undermined by internationalism and anti-patriotism, is not in a position to render the services to European civilisation which it formerly rendered. The war of 1870 was a warning; and to those who maintain that, since 1870, France has completely recovered her former strength, it may be replied that the Moroccan complication in 1905 found her entirely unprepared; and it is no secret for anyone living in Paris, and acquainted with French affairs, that the administration of the War Office by General André has done much to sap discipline, to stir up feud and dissension, and to encourage anti-patriotism. It may further be replied that the fact that M. Picquart, who some years ago was condemned by court-martial for insubordination, has since become Minister of War—this fact shows us with sufficient emphasis what might be expected from France in the event of a European conflagration.

What we would particularly insist upon is that the actual policy of England seems to be based rather on accidental occurrences than on ultimate consequences. The fact that Germany, by reason of her geographical position and of her superiority in organisation, is bound to be the Continental centre of the Germanic confederation against the Slav is overlooked. The fact that England, as a Germanic nation, is as much menaced by the Slav as Germany herself, is likewise overlooked; and importance is attached only to an accidental occurrence—namely, the commercial rivalry between Germany and England. In the same way the realities of the situation in France are overlooked. No care is taken to examine seriously the question as to whether a French alliance is likely to be of permanent and lasting benefit to England; and the whole attention of the English nation is concentrated on a side-issue: can France be used effectively as an instrument against Germany?¹ Friendship is cultivated with the United States, and we hear that any idea of dissension between England and America is impossible; and no care is taken to inquire if this friendship is reciprocated, and still less to ascertain whether the United States discern between England and the rest of Europe in the war they have undertaken against immigration and foreign importations. An alliance is concluded with Japan without any regard to the possible consequences of conflict between the white and the yellow races; and merely in order to satisfy a grudge against Russia, with whom an alliance is now also advocated.

¹ From the French point of view the benefit of the famous Anglo-French Convention of 1904 may equally be doubted. In return for the abandonment of undisputed rights in Egypt, France obtained a hornet's nest in Morocco.

great interest must necessarily be taken in the position of France and Italy. The ultimate question now dominating European politics is the supremacy of Slav or Teuton, and this conflict must have a preponderating influence on the future social and political formation of Europe. But the so-called Latin countries will not by any means play the part of passive lookers. If the conflict be primarily between Slav and Teuton, this is due in the main to two causes: the geographical situation of the Teutonic peoples and their organisation. The Teutonic peoples, by reason of their geographical situation, are the great barriers to Slav invasion; and by reason of their numerical importance, their discipline and their efficiency generally, they are the most formidable antagonists of the Slav. But the ultimate triumph of the Germanic race would not imply the eclipse of the so-called Latin civilisation. The task of this civilisation would be, on the contrary, to supply all that which is lacking in Germanic culture. Numerical superiority, iron discipline, admirable efficiency, render the German more apt for the great racial conflict than the Latin; but when the conflict has been decided, in the great work of social formation and civilisation necessitated by new conditions of life, the Latin genius, so profoundly artistic and so nobly idealist, will play a great rôle.

Undoubtedly the interest of France, considered from the point of view of its ultimate consequences, must coincide rather with that of Germany than with that of Russia. For France, as much as Germany and England, is menaced by the Slav; the culture and traditions of the latter are as antagonistic to French culture and traditions as to German culture; and, indeed, the triumph of the Slav would be the triumph of the East over the West, of the Asiatic over the European. France cannot desire such a triumph; and France must herself recognise that she is not in a position to check the advance of the Slav. Her geographical situation, her numerical inferiority, her want of efficiency, all render vain the hope of France championing the cause of Western civilisation against the Oriental. Considered from this point of view, the continued estrangement between France and Germany must be judged deplorable; and the impartial historian will comment with just severity on the policy of Prince Bismarck which has increased tenfold the difficulty of effecting a *rapprochement*. It can only be hoped that the seed of discord sown by the annexation of Alsace-Lorraine will not be reaped by later generations in the form of dissensions when menaced by the common foe—dissensions which might prove fatal to Western civilisation.

Viewed likewise from this point of view of ultimate consequences, an alliance between France and England can certainly be advocated. Unfortunately, the motives which have inspired the understanding with France have been different; it is not legitimate hostility to Russia—hostility derived from the nature of things—which has driven England to

conclude a defensive alliance with France; but unnatural hostility to Germany has caused her to form a pact which may be considered as offensive rather than defensive. From every point of view such a pact appears short-sighted. It does not seem that France would be able to render any efficient aid to England in the event of war with Germany; and it is hard to see how England could prevent an invasion of France and the occupation of Paris. From a higher and more philosophical point of view, the actual *rapprochement* between France and England, directed as it is against Germany, can only tend to render more difficult than ever the hope of reconciling France and Germany; while it must excite suspicion in Germany against England, thereby giving rise to much avoidable friction; and both these results, in the light of the ultimate consequences to Western civilisation of Slav aggression, are equally deplorable.

APPENDIX I

THE GROWTH OF INSANITY IN ENGLAND

IN connection with the chapter on insanity as a social factor, we have recently observed in the *Times* of April 14, 1906, the first of a series of articles on *The Growth of Insanity*, which fully confirms the statements we made as to the increase in the insanity-rate. We have cited Paris as an example; the article in the *Times* deals with England and Wales. That the result is identical will be seen from the following statement:

"In 1844 the total number of insane persons of all ranks, discovered in England and Wales by a careful official inquiry, was 21,788, or, roughly, 1 in 761 of the then existing population.

"On January 1, 1905, the number of insane persons actually under the control of the Commissioners was 119,829, or, roughly, 1 in 272 of the population as determined by the census of 1901; and throughout the whole of the intervening time the increase has been steadily progressive."

With regard to the physiological cause of insanity, the same article proceeds further on:

"We may therefore assume, at all events, as a hypothesis calling for inquiry, that the existing cause of insanity is analogous to the existing cause of drunkenness; or, in other words, that it is the presence in the blood, by which the brain is stimulated to activity, of some noxious agent by which the stimulation is rendered faulty in its character, so as to produce perversion of function, and by which, if it be present in a sufficient quantity or for a sufficient time, the structure of the brain tissue will ultimately be impaired."

We see that this hypothesis as to the toxic nature of insanity is entirely in harmony with the view that alcohol is one of the leading factors in the production of the disease. With regard to general paralysis, the article referred to states that the researches of Dr. Ford Robertson have led him to the conclusion that this affection is toxic, and that the toxin concerned is the product of a definite microbe which has been discovered in the fluids of the nervous system. This particular microbe, we may add, is very generally held to be, not a specific microbe of general paralysis alone, but the microbe of syphilis (*Spirochæta pallida*).

APPENDIX II

THE EXPENDITURE ON ALCOHOL IN VARIOUS COUNTRIES
AS COMPARED WITH THE EXPENDITURE ON OTHER
ITEMS.

Extracted from *La Revue de Statistique*, vol. x., No. 10, pp. 75 ff.
(Paris, 1906.)

FRANCE (1880-90).

	Millions of France.
Alcoholic drinks (alcohol, wine, and beer) ..	3,571
Bread	2,507
Meat	1,993
Coal	647
Potatoes	576
War Budget	555
Sugar	400
Tobacco	400
Iron, steel	259
Marine and Colonial Budgets	243
Public Education	134
Public Works	119
Public Worship	47
Administration of Justice	38

BELGIUM (1880-90).

	Millions of France.
Alcoholic drinks	544
Railway administration	110
Ministry of War	48
Tobacco	46
Ministry of Public Education	26
Ministry of Agriculture	21
Ministry of Justice	20
Ministry of Finance	19
Ministry of Public Works	4
Ministry for Foreign Affairs	3

ITALY (1899).

						Millions of France.
Alcoholic drinks	..	..	..	..	..	1,760
Public Debt	..	..	..	..	..	724
Wheat	..	..	..	..	..	612
Oil	..	..	..	..	..	440
Maize	..	..	..	..	..	352
Ministry of War	..	..	..	..	..	284
Tobacco	..	..	..	..	..	197
Marine	..	..	..	..	..	119
Coffee	..	..	..	..	..	56
Sugar	..	..	..	..	..	53
Public Education	..	..	..	..	..	46
Justice and Public Worship	..	..	..	..	..	40

GREAT BRITAIN (1880-90).

				Millions of France.		Millions of Pounds Sterling.
Alcoholic drinks	..	..	..	3,400 ¹	=	136
Bread	..	..	..	1,750	=	70
House rents	..	..	..	1,750	=	70
Butter and cheese	..	..	..	870	=	34
Milk	..	..	..	700	=	28
Tobacco	..	..	..	700	=	28
Sugar	..	..	..	625	=	25
Tea, coffee, cocoa	..	..	..	500	=	20
Public Education	..	..	..	275	=	11

¹ 25 francs = £1 sterling.



PART III
**THE ACTUAL CONDITIONS OF SOCIAL
SELECTION**



CHAPTER I

THE BIOLOGICAL AND TRADITIONAL FACTORS OF RACE PROGRESS

IN the first part of this work we examined the mechanism of heredity under those aspects which chiefly interest the sociologist. In the second part we examined certain aspects of social pathology which help to throw light on the existing conditions of society ; and this examination has led us to recognise the fact that, unfortunately, the beneficial influence of natural selection is not allowed sufficient free play in social life ; and the further fact that we are in presence of symptoms, serious and deep-seated, of social disease, which, if it be permitted to gain ground, may lead to deplorable results. We propose, in the third part, to deal with the question as to how it may be possible to diminish, if not to eradicate, these pathological factors which produce a weakening of the social organism and waste so much of its strength.

The tendency of organic evolution, its purpose—in as far as we are able to judge, and in as far as we may venture to ascribe a purpose to an evolution governed by iron mechanical laws—is the greatest possible multiplication of life. In the first chapter of this work, when dealing with the factors of selection, we saw that excessive multiplication was one of the essential features of the universal struggle for existence ; and we further saw that this seeming extravagance of Nature is not without its profound significance. For it is in the interest of the species to obtain the greatest possible multiplication of its members, an interest

both direct and indirect. Direct, in that multiplication always stands in direct ratio to the risk of destruction attending on the young individuals of the species; indirect, in that a species, if it is to maintain itself, must be adaptable in the highest possible degree; for, as we saw in the chapter on the origin and extinction of species, those species unable to adapt themselves rapidly enough to rapidly changing conditions succumb; and adaptation of the species as a whole can only be secured if that species presents a sufficiently large number of individuals for natural selection to act upon. Thus multiplication of life in the interests of the preservation of life appears to be the tendency of organic evolution.

But this tendency to an ever greater multiplication of life is not without producing a certain antagonism between Individuation and Genesis—between the individual and the species. On the one hand, the interest of the species is necessarily paramount and superior to individual interests; for if the species ceased to exist, the individuals composing it would also cease to exist; and thus the individual is interested in the maintenance of the species. On the other hand, the continuity of the species is accompanied by a more or less vast sacrifice of individual life. For instance, an adult individual, the single survivor of a hundred thousand germs, may itself be almost wholly sacrificed individually in the production of germs equally numerous; in which case the species is maintained, but at enormous cost both to adults and young. Or the adult, devoting but a moderate portion of its substance to the production of multitudinous germs, may enjoy a considerable amount of life, in which case the cost of maintaining the species is shown in a great mortality of the young. Or the adult, sacrificing its substance almost entirely, may produce a moderate number of ova, all well provided with nutriment and well protected, among which the mortality is not so great; and in this case the cost of maintaining the species falls more on the adult and less on the young. “And thus,” con-

cludes Herbert Spencer, from whom we have borrowed the above examples, "while, in one sense, the welfare of a species depends on the welfare of its individuals, in another sense the welfare of the species is at variance with the welfare of its individuals; and, further, the sacrifice of individuals may tell in different proportion on the undeveloped and on the mature."¹

The above considerations lead us to the conclusion that in the whole realm of organic life the individual is secondary to the species, and that the interests of the individual do but serve, in every case, to further the interests of the species to which they are subordinate. Thus, the individual is a *function* of the species, not an aim in itself. This subordination of the individual to the whole may be fittingly illustrated by the phenomenon of death. In a previous chapter we spoke of the biological immortality of the Protozoa; we saw that death, as a phenomenon resulting from a physiological necessity of the organism, is but secondarily superinduced, and that it is by no means inherent to organic life as such, it having first been introduced at a comparatively advanced stage of organic evolution—that is to say, when multicellular beings made their appearance. Death is essentially a phenomenon of adaptation, and a phenomenon of adaptation in the interest of the species at the expense of the individual. In the Protozoa the organism is not sufficiently developed to permit of part of it being destroyed and another part of it specialised for the reproduction of the species; a single cell fulfils all the functions of life, both as regards the individual and the race, and its destruction would entail the destruction of the species. In multicellular organisms, however, in accordance with the ever-increasing division of physiological labour, which is a phenomenon so universal and constant that we are justified in calling it a fundamental law of organic progress,²

¹ Spencer, *Principles of Sociology*, i. 593. Vide also *Principles of Biology*, ii., Part VI.

² Vide Milne-Edwards, *Leçons sur la Physiologie et l'Anatomie comparées de l'Homme et des Animaux*. Paris, Masson, 1857-81.

the soma alone is specialised for the needs of the individual life, and is destructible ; hence a greater individual differentiation and development is possible, greater variety, greater adaptability. But the germ specialised for the reproduction of the species is biologically immortal—at any rate *in potentia*. The individual is sacrificed to the reproduction of the species.

Thus, the maintenance and progress of the whole is only obtained at the expense of much suffering on the part of the components of the whole. Suffering is a law of organic Nature, and it may truly be said that without suffering there is no life. Our brief remarks concerning the antagonism of Individuation and Genesis sufficiently prove this. That suffering is a law of Nature, and that the only hope of attaining the goal of relative perfection is through much suffering, is an axiom which we are apt to lose sight of. “The greatest happiness of the greatest number” is the avowed doctrine of an entire political school, and of a very influential one. Yet on closer examination we shall perhaps find this doctrine less solidly established than its advocates think. For, in the first place, the concept of happiness is so vague, it varies so greatly with each individual nature, that sociology, if it remains true to its scientific constitution, can take no cognisance of it. And, in the second place, is it so certain that happiness be an aim in itself ? Do we, when contemplating the world of Nature, see any example which justifies the affirmation that happiness is the aim of life ? In truth, it seems rather as if the contrary were the case ; and, as far as we can speak of an “aim” in Nature—and it is dangerous to do so, for we risk falling into the teleological error of considering Nature as a mysterious entity in itself, of ascribing to it, with our habitual anthropomorphism, a sort of personality—in as far, we say, as we can discern an aim, that aim is not the happiness of living creatures, but rather, as we have said, the multiplication of life with a view to its ever greater adaptability and perfection—perfection being understood in the sense of the greatest possible expansion.

When we speak thus of perfection, it must be understood in a purely relative sense, as signifying perfection with regard to a given environment. Organic life is, indeed, unthinkable except with reference to the external conditions in which it evolves. Life is nothing if not a succession of relations between the organism and the environment in which it is placed, the environment acting on the organism, and the organism reacting to the stimuli from outside, each reaction corresponding in the degree of its intensity to the degree of intensity of its cause.¹ When we say of an organism that it is perfect, we mean that it is so thoroughly adapted to its environment that no further progress in the direction of this adaptation can be realised within the biological limits of that organism. And when we say that organic evolution, as far as we can discern its tendency, tends towards an ever greater and ever more complete perfection, we mean nothing else than that it tends towards an ever more complete adaptation of all organisms to their respective environments.

As this is evidently the tendency of organic evolution in

¹ It is to Auguste Comte that we owe the best definition of biological science: "La biologie positive doit être envisagée comme ayant pour destination générale de rattacher constamment l'un à l'autre *le point de vue physiologique et le point de vue anatomique*, ou en d'autres mots l'état dynamique et l'état statique. Cette relation perpétuelle constitue son vrai caractère philosophique. Placé dans un système donné de circonstances extérieures, un organisme défini doit toujours agir d'une manière nécessairement déterminée; et, en sens inverse, la même action ne saurait être identiquement produite par des organismes vraiment distincts. Il y a donc lieu à conclure alternativement, ou l'acte d'après le sujet, ou l'agent d'après l'acte. Le système ambiant étant toujours censé préalablement bien connu, d'après l'ensemble des autres sciences fondamentales, on voit ainsi que le double problème biologique peut-être posé, suivant l'énoncé le plus mathématique possible, en ces termes généraux: *étant donné l'organe ou la modification organique, trouver la fonction ou l'acte, et réciproquement*. Une telle définition . . . indique clairement que la vraie biologie doit tendre à nous permettre de toujours prévoir comment agira, dans des circonstances données, tel organisme déterminé, ou par quel état organique a pu être produit tel acte accompli" (*Cours de Philosophie positive*, vol. iii., p. 237, fifth edition, 1893).

general, so is it also the tendency of social evolution in particular. Just as the less-adapted organism succumbs in the struggle for existence with the better-adapted organism, so does the society which is less well adapted to its environment find itself at the mercy of those other societies which have displayed greater adaptability. This—i.e., greater adaptability—being the tendency of social evolution, we may ask, What means does social evolution employ in working this out ?

In attempting to reply to this question we must be careful to distinguish between the organic and the traditional factor in social evolution. As Professor Ritchie has remarked : “ Human beings, besides sharing in the biological transmission of inherited characteristics, have also other modes of transmitting sentiments and customs ; they are not dependent merely on heredity in the biological sense. They can ‘ inherit ’ by means of language and institutions the experience of their ancestors, which would otherwise be lost and have to be acquired afresh. . . . This capacity for *social inheritance* is the great advantage that mankind possesses over the brutes, and the greater perfection in the modes of transmitting experience constitutes the advantage of civilised over uncivilised races. I have already suggested a definition of civilisation as the ‘ sum of those contrivances which enable human beings to advance independently of biological heredity. ’ ”¹ It is impossible to give a better definition of what we term the traditional factor in race progress—the factor, namely, which enables society to advance independently of biological heredity.

The traditional progress of society may be observed partly in the evolution of its institutions ; partly in the evolution of its unwritten laws, customs, and traditions, in so far as these are not embodied in any institution which is their concrete expression ; and partly in the evolution of its thought and intellect.

¹ D. Ritchie, *Darwinism and Politics*, pp. 131. 132. Sonnenschein, 1901.

Obviously a society which is able to embody its customs and traditions in institutions is already considerably developed. Such embodiment does not exist in societies in the lowest stage of evolution, or does so only in the smallest and most insignificant degree. Let us turn to the higher societies, to those which occupy the first rank in the civilised world to-day, and ask ourselves, What is their social polity? What is the immediate and ultimate aim of their social evolution considered in its traditional aspects? What do we find?

A detailed examination of the social evolution of even one of the great European Powers to-day would lead us too far in our present task. We will content ourselves, therefore, with asking, not what that social evolution *is*, but what it ought to be, according to the laws which, we think, can be deduced from our study of social pathology in the second part of this work. And, in the first place, let us remark that it is an error to consider the immediate and the ultimate aims of social evolution as distinct; although, indeed, the *Realpolitik* in favour to-day would seem to ignore the ultimate aim, which is the organic progress of society, in its anxiety to realise temporary success through the injudicious cultivation of over-rapid traditional progress, which should constitute only the immediate aim of social evolution.

Coming, then, to the question of the direction of social polity, we should reply that, in the domain of traditional values, the aim should be the growing *integration* of society and the economy of social force. The study which we have made of suicide as a sociological factor has shown us the harmful results of insufficient social integration, and the growth of mental disease can be attributed in the ultimate instance to the same cause. We are living in an age in which the rights of the individual are held to be supreme, in which the duties of the present generation towards the coming generations are ignored, and in which the individual as such, and by the sole fact of his individuality, is raised to the height of a metaphysical entity. This excessive individualism,

This is not a treatise on moral philosophy, and we have not the remotest intention of doing anything more than point out the *sociological* necessity for an ideal which is super-individual, if we may use the expression. We have nothing to do with the moral aspect of any ideal, but purely and simply with the sociological aspect of ideals in general. Individualism, as preached by that philosopher who is, unfortunately, all but unknown in England, Max Stirner, is a philosophy for the few, for the very few: it is an hyperaristocratic philosophy; it is the doctrine of economic individualism and *laissez-faire* carried, as we shall see, to its logical conclusions. But it is a philosophy which, if adopted by any great number of people, would lead infallibly to social dissolution: ignoring, as it does, the existence of all society, and taking account only of the individual, of the Ego who cries ferociously, "Ego sum Ego; I am Myself, and My Object is My Own, My Aim My Own."¹

grosse Stimulans zum Leben: wie könnte man sie als zwecklos, als ziellos, als *l'art pour l'art* verstehen? . . . Was teilt der tragische Künstler von sich mit? Ist es nicht gerade der Zustand ohne Furcht vor dem Furchtbaren und Fragwürdigen das er zeigt? . . . Die Tapferkeit und Freiheit des Gefühls vor einem mächtigen Feinde, vor einem erhabenen Ungemach, vor einem Problem, das Grauen erweckt-dieser *siegreiche* Zustand ist es, den der tragische Künstler auswählt, den er verherrlicht" (*Werke*, viii. 135, 136, Leipzig, 1895). And, while we are occupied with Nietzsche, what can be more beautifully characteristic of his conception of the artist as a redeemer of the world's ugliness than the following passage: "Es steht Nichts für sich, weder in uns selbst noch in den Dingen; und wenn nur ein Einziges Mal unser Seele wie eine Saite vor Glück gezittert und getönt hat, so waren alle Ewigkeiten nötig um dies Eine Geschehen zu bedingen: und alle Ewigkeit war in diesem einzigen Augenblick unseres Jasagens gutgeheissen, erlöst, gerechtfertigt und bejaht." And in another place we find the triumphal assertion: "Wo ist Schönheit? Wo ich mit allem Willen wollen muss; wo ich lieben und untergehen will, dass ein Bild nicht nur Bild bleibe" (*Werke*, vi. 180).

¹ Max Stirner, *Der Einzige und sein Eigentum* (Berlin, 1843). John Henry Mackay, *Max Stirner, sein Leben, sein Werk* (Berlin, 1898). V. Basch, *L'Individualisme Anarchiste: Max Stirner* (Paris, Alcan, 1904). A French translation of Stirner's work has also been published under the title *L'Unique et sa Propriété* (Paris, Stock, 1900).

its component members in a strong and solid union. The individual, firmly attached by multitudinous ties to his corporation, and through his corporation to his fatherland, considers himself as a part of the whole to which he is thus attached; the interests of the whole are his interests, and the pride which he naturally feels in the corporation to which he belongs reacts on his own life, and imparts to it a value that it did not possess before. The possession of an ideal—that is the secret. For it is the possession of an ideal which alone can raise the individual above himself, and permit of his seeing a new horizon beyond that of his own interests and pleasures. The possession of an ideal which surpasses and transcends the individual life imparts a value to that life, and binds its holder to it. And the more an ideal surpasses and transcends the individual life, the more influence will it exert. The ideal of patriotism is capable of inspiring a man with attachment to life by filling his mind with other than purely personal thoughts, and by inspiring him with pride in the nation to which he belongs. But it is essentially a temporary ideal, being limited to the duration of the life of the individual. It is obvious that the religious ideal, which dominates, for those who believe in it, not only this earthly life, but eternity, cannot fail to exercise a correspondingly strong influence.¹

¹ It is obvious that we have no intention of discussing the objective validity of any religious belief, a question wholly foreign to our research. We would further point out that when we speak of the ideal of the Super-Man as transcending the individuality, and yet inherent in it, we mean that a Super-Man or genius finds in the pure creation of his genius a sufficient stimulus to life, a sufficient justification of it. Did not Schopenhauer, from an opposite point of view, consider the value of art as residing in the fact that it releases us, if only for a few moments, from the tyranny of desire? That is to say, Schopenhauer considered it as transcending the individuality, although necessarily inherent in it, since every work of art is a personal creation. Nietzsche, whose conception of art is so opposed to that of Schopenhauer, nevertheless agrees in considering art as an ideal in itself, transcending the bounds of individual life; and Nietzsche regards it as the great stimulant of life: "Die Kunst ist das

must be preceded, if it is to be effective, by progress in organic evolution. A certain degree of organic evolution is a *conditio sine qua non* of all traditional progress. For instance, had the human species remained in the stage in which the savage populations of Central Africa still find themselves to-day, all the progress in human institutions which we justly consider the greatest triumph of man over his animal ancestors would necessarily have remained unknown. It is probable that cerebral progress, which is the instrument of what we term traditional progress, is dependent on an increase, amongst other things, of the volume of the brain. Thus, the average brain-weight of the adult male members of the white species is from 1,350 to 1,360 grammes, that of an adult male member of the negro species 1,262 grammes, while that of the gorilla is but 550 grammes, on an average, for it varies considerably. If the difference between the civilised European of to-day and the Wood-Veddah of Ceylon is greater than the difference between the Wood-Veddah and the higher apes, it is due not only to the traditional progress of the former, but also to his organic progress. The latter forms the indispensable basis on which the superstructure of the former can be built.¹

It is true that organic and traditional progress do not always

¹ It is often objected that the cerebral differences between the lower races of man and the anthropoid apes—the gibbon, for instance, who is more closely allied to the human species than the orang-outang or the chimpanzee—are too great to be able to admit of a *rapprochement* between them. But this objection does not take count of the fact that all attempts to argue from the physiological to the psychological are extremely problematical in their results. The old theories of a necessary relation between brain volume and brain capacity are largely discredited; and we must beware of following the example of a Russian *savant* who was fond of insisting on the inferior size and weight of the average brain of women as convincing proof of female incapacity for discharging the duties of citizenship; and who was found, after his death, to possess himself a brain inferior in volume and weight to the average female brain. We are entirely unable to discern the exact relations existing between the physiological and psychological capacities of the organ of thought.

keep pace one with another; and we often see an artificial development of traditional progress under conditions which are unfitted to it. This would be the case, for instance, in a State which, while encouraging the development of industry and agriculture and commerce by means of a system of economic protection, should neglect the eugenic development of its inhabitants; and these latter, showing no increase in population and great increase in physical and moral disease—which latter is likewise a symptom of organic degeneracy—will, at the first opportunity, fall victims to neighbouring States with greater fertility, where the operation of natural selection in eliminating the socially unfit is more active.

Thus we may safely lay down as an axiom of sociology that those States whose social and political evolution does not tend, or tends insufficiently, in the direction of combined biological and traditional progress, will be vanquished in the struggle for power with other States having a polity more in harmony with the laws of biological and social evolution. For it is not sufficient that a nation be biologically superior if its traditional progress be insufficient, or *vice versa*. There is absolutely no reason to suppose that the French nation was organically inferior to the German nation in 1870; but it was unquestionably inferior in its social organisation, which means, translated into our terms, that its traditional progress was inferior. And, to take the opposite case, it is certain that the Athenians were traditionally superior to the Macedonians, and yet they succumbed at Agosspotamos owing to their biological deterioration. And, finally, to take a third case, the Byzantine Empire was annihilated by the capture of Constantinople, because the Turks were, at that period at any rate, both biologically and traditionally superior to the motley crowd of their hybrid antagonists.

Those States which tend to develop in a direction directly contrary to this law of correlated biological and social evolution will be vanquished in the struggle for power with other States; and the same will be true of those whose evolution, although in

the right direction, is not sufficiently rapid to keep pace with a rapidly changing environment. In a former chapter on the origin and extinction of species we remarked that in a great many cases the extinction of species may undoubtedly be traced to the fact that the necessary variations called forth by the readaptation of the species are not forthcoming quickly enough. We saw that the extinction of the Trilobites at the end of the Silurian epoch was very probably due to the fact that this type of animal, long adapted to constant conditions, was unable to readapt itself with sufficient rapidity to the suddenly modified environment. In the same way nations which are more adaptable are more likely to survive than those which are less adaptable. If the environment change more rapidly than the nation is able to change, that nation will be superseded by others whose power of readaptation is greater. Nations which have long been adapted to similar conditions are, as a rule, less readily readaptable than young nations; but the theory that nations, long habituated to a similar environment, are necessarily affected by senile decay, is entirely contradicted by the astonishing ease with which Japan, adapted for 2,500 years to a given system of government, changed that system radically in an extraordinarily short space of time. *With nations, as with species, survival is dependent on plasticity.*

Traditional progress is necessarily much faster than organic progress. Those who have followed our exposition of the theory of descent in the first part of this book will understand how difficult it is for the germ-plasm of an aggregate, be it a species, a race, or a nation, to be altered; for acquired characters which affect only the body of the individuals are not transmitted by heredity. The alterations of the germ-plasm are all produced by variations which arise within itself by movements among the determinants, by shiftings of the balance caused by differences in intragerminal nutrition. And the vast majority of variations are called forth by the need for *adaptation*. As soon

as the environing conditions change, the species must readapt itself to the new conditions, and the never-ceasing movement within the germ-plasm must in 9,999 cases out of 10,000 present a variation which can be selected by natural selection; and all those individuals presenting this variation will be selected, while those who do not present it will be eliminated. Through the mechanism of amphimixis, as we have seen, the adaptation of the species is brought about and maintained by means of the constant and ever-renewed intermingling of germ-plasms which present the requisite favourable variation. The direct action of climate is, indeed, capable of effecting variations, but its action has certainly been exaggerated by Lamarck and, among biologists of to-day, by Delage. Thus the process of readapting a species is necessarily slow; for the numerous somatic modifications effected during the lifetime of the individual are not inherited, and the change of environment is rarely so brusque and violent as to require a brusque and violent transformation of the whole species. In the majority of cases, when a sudden cataclysm brings entirely new conditions into force, the old species succumb, being unable to adapt themselves with sufficient rapidity to the new conditions.

It is otherwise with traditional progress. Here, once begun, progress is far more rapid than is the case with organic progress. We say "once begun." For Bagehot has long since pointed out the great difficulty which primitive peoples, tied down to certain customs and traditions, experience in breaking loose from these traditions; which, originally indispensable, subsequently become obstacles to further progress. The great necessity, the indispensable necessity, for primitive peoples, as Bagehot has remarked, is the *integration* of the tribe or the clan; and this can only be attained by unanimous adherence to a common leader and a common polity, the latter being summed up in a common tradition. "The first thing to acquire is, if I may so express it, the *legal fibre*; a polity first—what sort of polity is immaterial;

a law first—what kind of law is secondary ; a person or set of persons to pay deference to, though who he is, or they are, by comparison scarcely signifies.”¹ But if a polity be indispensable to these early groups, there is a risk that this polity may subsequently become a positive obstacle to further social progress. As Bagehot says : “ Either men had no law at all, and lived in confused tribes, hardly hanging together, or they had to obtain a fixed law by processes of incredible difficulty. Those who surmounted that difficulty soon destroyed all those that lay in their way who did not. And then they themselves were caught in their own yoke. The customary discipline, which could only be imposed on any early men by terrible sanctions, continued with those sanctions, and killed out of the whole society the propensities to variation which are the principle of progress.”²

Bagehot rightly sees in the breaking of this tyranny of tradition the greatest event in the history of social progress, although it be in a sense an unrecorded event. Certainly those peoples who, having had the ability to create for themselves what Bagehot calls a “ cake of custom ”—that is to say, those peoples who were able to reach a stage of social life sufficiently integrated for fixed custom and tradition to exist ; and who were subsequently able to escape being imprisoned by the force of the customs and traditions which they had created, who were able to break down that barrier of custom and tradition which was their handiwork—these peoples were assuredly gifted with a biological superiority which alone could render possible their social adaptability. Those peoples who were able to sacrifice old traditions and customs—the fruit of the ages, binding as such traditions and customs always are, and as they alone can be—in order to adapt themselves to new conditions incompatible with these were biologically superior peoples.

Adaptability is a primary necessity for the social as for the

¹ W. Bagehot, *Physics and Politics*, p. 50. Kegan Paul.

² *Ibid.*, p. 57.

iological organism. The *conditio sine qua non* of all social existence is that a society should be able to adapt itself to its conditions of existence. All change in the structure and in the organisation of societies is brought about solely by change in the environment in which that society lives. As with species so with societies ; as long as the environment remains constant, the species or the society remains constant. If this environment changes, the species or the society undergoes a corresponding change. If the great Chinese Empire remained absolutely stationary—or nearly so, for all things are relative—for three thousand years or more, the reason is to be found in the constancy of its environment. Until the middle of the nineteenth century China was shut out from the rest of the civilised world. With the British expedition of 1860 a change set in. This expedition was itself but the result of the modifications effected in the political situation of the whole world by the progress of the applied sciences. Faster ships and increased facilities for transport had gradually brought China into touch with the Western world. And, ever since the first treaty ports were opened, this process of bringing China nearer to the West has gone steadily forward. To-day the different Western Powers are rivals in the Chinese market ; China is being “ opened up ” by Western capitalists, railways are being constructed in her interior, and one is projected, and will probably soon be completed, which is to join the capital of the Middle Empire with Moscow, and via Moscow with Berlin and Paris. So profound a modification of the situation of China cannot but bring equally profound internal changes in the whole fabric of Chinese society. True, the Chinese Empire is very vast, and news penetrates but slowly and scantily, if at all, into the interior ; but the movement which has commenced cannot be checked, and must result in the modification of China. Either the Chinese Empire will have to adapt itself, as Japan did, to the new situation created by the intervention of Europe in the affairs of the Far East ; and,

adopting the weapons of the Western nations, must beat them on their own ground as Japan beat Russia ; or, sooner or later, China will inevitably succumb to the invasion of the West, and partition between the European Powers will be her fate. Here, as elsewhere, the alternative is adaptation or elimination.

This alternative presented itself to Japan thirty-five years ago, and she made her choice then. When the American fleet first came to seek to open commercial relations with the Empire of the Mikado, Japan was forced to choose between either the acquisition of Western culture and Western methods, so as to beat the West with its own weapons, or else the conservation of the old régime and eventual annihilation. It says much for the foresight of the Japanese, and much for their power of adaptation, that they chose the former alternative. History knows no other instance so striking of an old nation, which was highly civilised before Christianity was ever heard of, adapting itself with such wonderful rapidity to conditions diametrically antagonistic to those in which its whole evolution had taken place. A nation capable of thus adapting itself, of thus breaking down the barriers of custom and tradition 2,500 years old, is a nation whose organic, or biological, superiority is incontestable. But had not the applied sciences made such enormous progress, had not the Western world, through the development of these, been brought into closer touch with the East, the East would not have changed, for there would have been no reason for the change. The evolution of Japan has been in correlation with the evolution of other States.

For, be it noted, the evolution of society must be determined in accordance with two factors. First, the evolution of neighbouring societies, and, second, the shiftings of the balance of power within the society itself ; just as the development of the individual is determined by that of other individuals, and by the miniature struggle between the determinants of its own germ-plasm. The examples of China and Japan show us an evolution brought about, not by internal necessities, but by the external

stimuli. In the case of European States, the causes which have presided over social evolution are multiple and complex; but, in ultimate instance, the evolution of every nation in Europe to-day is determined by that of neighbouring nations and by that of its own social classes.

It is essential for the welfare of a society that its evolution—that is to say, its rate of adaptation—should keep pace with the rate of change in the environing conditions. As we have said, should the environment change more rapidly than the society is capable of changing, the extinction of the society must follow. But, conversely, the rate of traditional evolution must not exceed the rate of biological evolution. Every society possesses—in a greater or less degree, but always approximately—that form of government which is appropriate to it. This merely amounts to saying that the institutions of every society correspond, more or less, to its degree of organic evolution. Of course, the very fact of a nation possessing a large amount of traditional property proves that nation to have a particular character of its own; and national character, according to Bagehot, is determined by imitation; this appears also to be the view of Gabriel Tarde.¹ But although national character reflects the nature of its traditions and institutions, these reflect in turn the organic

¹ Tarde has nevertheless admitted distinctly that the individual factor is the chief factor in the formation of national genius. This amounts to recognising that the traditions and institutions of a nation are the work of individuals; which, in turn, implies that, as institutions are what individuals made them, so they are a reflection of the biological value of the nation, as determined by the biological value of its leaders. “A la longue,” says Tarde in his last book, “il faudra bien ouvrir les yeux à l’évidence, reconnaître que le génie d’un peuple ou d’une race, au lieu d’être le facteur dominant et supérieur des génies individuels qui sont censés être ses rejetons et ses manifestations passagères, est tout simplement . . . la synthèse anonyme de ces originalités personnelles, seules véritables, seules efficaces et agissantes à chaque instant. . . . Le génie collectif, impersonnel, est donc fonction et non facteur des génies individuels, infiniment nombreux” (*Les Lois Sociales*, pp. 44, 45; Paris, Alcan, 1905). *Vide also Les Lois de l’Imitation*; Paris, Alcan, 1896.

or biological value of the nation. Tradition may have great influence in moulding national character ; but tradition goes hand in hand with biological factors, which must not be lost sight of. Tradition has to-day enormous influence in the moulding of the character of the East Indian ; but it must have exercised not less influence on the Japanese of the *ancien régime*. And yet while Japan has been able to throw aside the traditions and institutions of centuries, India remains to-day pretty nearly where she was a thousand years ago. The institutions of modern Japan are suited to the biological superiority of her people, those of India to the biological inferiority of hers. The Indian, it will be objected, is not physically inferior to the European or to the Japanese. But it has yet to be shown that the Indian possesses the power of adaptation, of organisation, of assimilation possessed by the Japanese. Until we have proof of this we are justified in considering him as biologically inferior.

To return to our subject, the rate of evolution in society must conform to the possibilities and also to the needs of that society. History furnishes so many examples of a radical change effected in the institutions of a people which is not ripe for these changes that the details of them would fill a bulky volume. The internal evolution of society must be determined by the shifting of the balance between the different elements of that society. It must be directed in such a way that it conforms to the historical institutions of the society, and also to the modifications of power effected within the society. As Anton Menger, the late distinguished Rector of Vienna University, expressed it : " Every system of law is a reflection of the balance of power which has developed within a society in the course of that society's historical evolution. The interests of the governing classes, when they are able to maintain their supremacy during long periods, become transformed into laws and criteria of right and wrong, which claim recognition from the other classes of society as objective truths. Should, however, the balance of power be

shifted, these laws and criteria are deprived of their natural basis, and revert once more to their original basis in party interests. It is the task of sociological jurisprudence to observe these shiftings of the balance of power, and to draw from this observation conclusions as to the future constitution of jurisprudence. Especially must sociology be careful to maintain the congruity of Right and Might, and to prevent, as far as possible, the social disasters which must ensue from an antagonism between these factors.”¹

In other words, all legislation must take into consideration not merely the traditions of the past, but also the facts of the present. And the balance of power between the various component elements of a society, which is an undoubted fact of every “present,” must be the chief consideration of the legislator. The traditions of the past must only be taken into consideration in so far as they are also elements of resistance to reform in the present, for it is the duty of the social reformer to take into consideration the elements of resistance to every project of reform. It is upon the measure of the resistance that may be expected to it that the possibility of every reform depends. Generous utopianists would fain see a number of reforms enforced, some of which, though by no means all, would incontrovertably be of use to the society at large; but they forget that the usefulness of a reform is no guarantee of its popularity, for prejudice and tradition are stronger than any appreciation of the real needs of society. This ignoring at the present time of the elements of resistance is the chief reason of the failure of so many reform projects; and it is fatal to social legislation. It must be the task, the difficult but necessary task, of sociology to affect an adaptation of social reform projects to the actually prevailing conditions.

¹ A. Menger, Rectoral Discourse at Vienna University, 1895. Cited by W. Schallmayer, *Vererbung und Auslese im Lebenslauf der Völker*, p. 236. Jena, 1903.

But the traditions of the past must be neglected, except in so far as they may constitute an element of invincible resistance which condemns a social reform project *a priori*. The realities of the present, the condition of the balance of power among the different elements of the society, must occupy the first place in the mind of the legislator. Neglect of this condition leads to the making of impossible laws which take no account of the trend of social evolution. The prohibitive duty on corn passed in England in 1815 by a Parliament representing almost exclusively the aristocracy and country gentry is an example of this neglect of the actual conditions of social evolution. Here was England, already with a highly-developed industry in which hundreds of thousands of working men were employed, placing a duty on foreign corn which rendered bread wellnigh unpurchasable for the great masses of the people in the interests of a small minority of landowners. The agrarian policy of the German Government to-day is very similar; for here also we see an essentially industrial country taxed to the uttermost in the interests of the landed proprietors east of the Elbe. The policy of the French Convention relative to the Church is another instance of this neglect to take the potential factors of the present into consideration; and the result was that, less than twenty years later, Napoleon was compelled to conclude a new treaty with the Papal See. Whether the policy of the French Government at the present time towards the Church does not constitute a similar instance of ignorance of the real relations between the divers factors in the balance of social power remains to be seen.

All these, and innumerable others, are instances of what we may call *Utopian* legislation—that is to say, legislation undertaken without any knowledge of the precise relations existing between the different elements of the social organism, and which is at once futile in the present, as far as its purposes are concerned, and eminently productive of harm in the future. The duty of sociology is to demonstrate the paramount necessity

of basing social legislation on an adequate knowledge and appreciation of the factors in the balance of power within the society. The rapidity of social legislation must necessarily be proportionate to the needs of the society; and the needs of the society must be measured according to those of the great majority of that society. A bare majority may not suffice; for the large and powerful minority, being nearly as great as the majority, has also a right to share in the determining of the polity of the social body. But when, as in England in 1815, a minority which is very small in numbers and still smaller in intelligence pretends to have the right to bleed the entire community in order to subserve their exclusive interests, then no doubt can exist as to what the needs of the social organism really are, and as to the direction which social evolution should take.

The dynamic conception of social evolution is thus based on the recognition of the balance of power within a nation or society as the starting-point and guide of all social legislation. The difficulties attendant on all social legislation are obvious. Social evolution—in the field of tradition which legislation and institutions in general partake of—is retarded by many obstacles, of which the opposed interests of different social classes and the ignorance or imperfect knowledge of the masses are the chief. All social legislation reflects the balance of power within the society; and if one of the elements of the social organism is excluded from all share in power, we may be sure that its interests will not be furthered, although their furtherance might be extremely advantageous to the whole society. Thus, before the labouring classes in England attained some share of power, the childhood of the country was subjected to extenuating labour in factories and mines; the working man, unable to unite with other working men in the defence of his interests, was at the mercy of his employers; hours were long, remuneration small, and the cost of living, exaggerated by the excessive protection laws, was high. It is true that the Factory Acts, which abolished the worst

scandals connected with child and female labour in factories, were passed before the Reform Act of 1867 admitted working men to a share in the franchise. But the Factory Acts were, none the less, passed under the pressure of public opinion; and public opinion cannot be strong enough to exercise an influence on the ruling party unless those who voice it are not only numerous but, to a certain extent, organised. The legislator who passed the Factory Acts did so in order to preserve for himself at least the nominal supremacy in the State; but the virtual supremacy of a ruler, whether an individual despot or a despotic majority (and the latter is the worst foe of all progress), is at an end on the day on which that ruler or that majority abdicates by giving way to the pressure of public opinion. On that day the balance of power in the State is shifted, and the ruling power recognises the existence of another power, which is stronger than itself, to which it is obliged to give way. The number of people who suffered from the extravagance and extortions of the old régime in France was probably as great in the reign of Louis XIV. as in that of Louis XVI.; but as yet there was no public opinion, the opposition was not organised, the sufferers were still unconscious of their potential strength. But a new power entered into active politics on the day on which Louis XVI. signed the decree of convocation for the States-General.

It is, therefore, of the highest importance for the welfare of society that the congruity between Right and Might, as Anton Menger expresses it, be maintained. For, in the first place, legislation systematically carried on in the interests of one class cannot but be prejudicial to the interests of the other classes, and in this manner an immense amount of social energy is wasted; whereas precisely the greatest possible economy of social energy should be the aim of the legislator. And, in the second place, when the antagonism between the direction of social polity and the inherent needs of the social organism reaches a

point which cannot be surpassed—as in the case of France in the eighteenth century, when the polity of the *ancien régime* finally reached a climax which rendered its further continuance impossible, owing to its total incompatibility with the real needs of the people—then the violent antagonism between the two threatens to result in a social catastrophe which menaces the very foundations of society; and which, in its turn, necessarily implies a terrible weakening of the social organism, a terrible wastage of social force. The task of sociology is therefore a high one, although most difficult—namely, the reconciliation between social polity and social reality, so to speak; or, in other words, the adaptation of the polity of a society to the needs of that society.

We have said that the traditions of the past must only be taken into consideration by the legislator in so far as they are also elements of resistance to reform in the present. But by this we are not to be taken as implying that the traditions of the past have no value in themselves. As Bagehot excellently remarks: ‘In 1789, when the great men of the Constituent Assembly looked on the long past, they hardly saw anything in it which could be praised or admired or imitated; all seemed a blunder—a complex error to be got rid of as soon as might be. But that error had made themselves. On their very physical organisation the hereditary mark of old times was fixed; their brains were hardened, and their nerves were steadied by the transmitted results of tedious usages. The ages of monotony had their use, for they trained men for ages when they need not be monotonous.’¹ Social evolution in the present must be directed with regard to the historical development of the society as well as to the needs of the moment. What we mean is that an institution is not necessarily suited to the realities of the present because it has rendered inestimable service in the past. We yield to none in our admiration and love of the great past, of the

¹ *Physics and Politics*, p. 30.

ages of heroism and chivalry and piety which have added lustre to the fame of human society that the future can never dim or tarnish. But the balance of power within the social organism has shifted since those bygone days ; and it is the duty of the sociologist, not only to investigate the law of the evolution of nations in the past, but to apply these laws to the evolution of society to-day and in the future. Class legislation has had its uses ; it was doubtless indispensable in an age in which the industrial system of to-day did not exist. But to-day class legislation means waste of social strength. If brutally carried out in the interests of a tyrannical majority, it has as its natural effect the relaxation of the ties which bind the oppressed minority to the society as a whole ; and such alienation of a part of the social organism is like the loss of a limb by the individual organism. The society which thus alienates a part of its members will necessarily be greatly weakened, and will necessarily succumb sooner or later to a nation which has preserved its patrimony intact. Discord is as fruitful a cause of the extinction of societies as concord is a strong guarantee for their survival. " Union is strength," says the proverb, and this proverb expresses a truth often illustrated in the annals of social evolution. Russia is the latest, but not the least striking, example of the counter-truth that discord is weakness.¹

¹ The progress of Socialism during the latter half of the nineteenth century affords a most remarkable example of the truth of the proverb " Union is strength." The unity of the proletariat was the war-cry of the celebrated *Communist Manifesto* issued by Karl Marx ; and the unity of aim and purpose which has characterised the action of the Socialist party in all countries has contributed much to overcoming the difficulty raised by the numerical strength of the proletariat. The evolution of capitalist production has greatly aided the Socialist party in this particular task ; but none the less must the discipline of the party be admired, and discipline, of course, is only possible where unity of aim has been previously assured. As M. Eugenio Rignano, in a noteworthy book, has remarked : " The inconvenience of great numbers can be counterbalanced, and sometimes even done away with, by the unity of the aim to be realised. Community of interests does not only facilitate the concerted action of a

If legislation, on the other hand, be carried out by a minority in its own interests, careless of the interests of society as a whole, the result will be doubly disastrous ; for it will weaken society in the present, and prepare a catastrophe for the future, when the antagonism between polity and social reality, as we have said, can be carried no further. Can anyone maintain that an industrial system which compelled young children and women to work over twelve hours a day underground, or in the unhealthy atmosphere of factories never inspected or controlled, could be carried on without undermining, without ruining the biological value of the entire race, without sapping its vigour and vitiating its energy ?

But, on the other hand, if class legislation, which takes no account of the interests of those who constitute the labouring population, be pregnant with misfortunes, legislation which is over-zealous in the supposed defence of these interests is equally harmful. We have seen that traditional progress—by which we mean the progress of legislation and institutions—is much faster than biological progress. But the chief maxim of every legislator should be not to outrun too greatly the pace of this organic evolution. Over-hurried legislation is as injudicious as legislation which is too slow. Social evolution in one State must be based, as we have said, on the social evolution in other and neighbouring States ; and it must, in the second place, take account of the realities of the internal situation of the State itself.

To sum up, we may say that traditional and legislative progress is likely to be considerably less rapid than some social enthusiasts suppose, obstructed as it is by the conflict of opposed interests, and by the indifference and ignorance of the masses.

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In sum up, we may say that traditional and legislative progress tends to be considerably less rapid than some social enthusiasts suppose, obstructed as it is by the conflict of opposed interests, and by the indifference and ignorance of the masses.

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Add to this the fact which must not be overlooked—namely, that legislation is, in the great majority of cases, in the hands of men who are no longer young, and who are, consequently, less receptive to new ideas with which in their youth they were not familiar; and we shall be able to appreciate more correctly the chances of the rapidity of social evolution. In the second place, traditional progress is conditioned by organic progress, and is subordinate to it. So much, indeed, is this the case that a traditionally inferior nation which is biologically superior can beat a nation which is traditionally superior and biologically inferior; although the ideal State will be the one which combines traditional and organic progress. It follows that no nation can cultivate traditional progress and neglect corresponding organic progress without risk of elimination. The nation must, in its evolution, take into consideration the evolution of other States, and direct its polity accordingly. Athens neglected to do this; she became a nation of thinkers in a world of warriors, and she succumbed in consequence. Similarly, the polity of a nation must take heed of the shiftings of the balance of power within itself—shiftings which are caused by other factors, chiefly economic. Otherwise there is a danger that its evolution will result, in a future more or less remote, in dissolution.

CHAPTER II

THE BANKRUPTCY OF LIBERALISM

attempting to indicate, not a solution of the social problem such—for that problem, like the poor, will be always with us—to some remedies for the condition of social uneasiness and instability in which we find ourselves at present, it is well, or rather it is essential, to examine the nature of that social polity under which civilised societies, as a whole, exist to-day. The time under which European nations, as also the great transatlantic Republic of the United States, and Japan—which must, indeed, be considered as one of the great Powers of the world after the defeat of Russia—are all governed is what we term the Liberal régime—that is to say, the régime of Parliamentary government, of government by the people themselves. Degrees exist in the application of the Liberal régime, as in the application of everything else; but one thing common to all the civilised nations of the world—except Russia, whose contribution to European culture has not, as yet, been proportionate to the numbers of her population, owing to the peculiar state of her internal affairs—is that they all possess a Parliament, a representative body, elected by popular suffrage, and sometimes, as in France and Germany, by universal suffrage, and that, in a word, their form of government is popular, as distinct from personal or absolute.¹ In Great Britain the Liberal—by which we mean the popular—form of government² has existed for centuries, and is

¹ This was written before the meeting of the first Russian Duma.

² It must be very clearly understood that we employ the word "Liberal" in a general sense, as indicating "representative" traditions, in distinc-

intricately bound up with the historical evolution of the nation since the reign of Henry III. In the other States of Europe the impulse to popular government was invariably given by France, by her Revolutions of 1789 and 1848; indeed, it was from France that Bismarck borrowed the idea of universal suffrage with which he enriched the newly founded German Empire in 1871.

Thus, it is under the auspices of Liberal tradition and Liberal polity that the nations of Western civilisation have grown to what they are at the present day; that the industrial and commercial system has developed; and that the biological evolution of the civilised peoples has gone on during the last few generations in the case of most, but in the case of the English during very many generations. It is the system of Liberal polity which we find to-day presiding over the destinies of civilised mankind. Liberalism has produced its economists, its philosophers, its jurists, its sociologists, its politicians; and it is well to examine briefly whether, firstly, Liberalism has kept the promises made in its name by all its most eminent representatives; and whether, secondly, it is theoretically as far above reproach as one might sometimes be tempted to think.

Let us take the second point first. What, we may ask, is the theory of Liberalism? If we turn to Kant, we find the following definition of the State: "A State is a body of laws affecting persons and their rights (*eine Menge von Menschen und Rechtsgesetzen*), according to which each one of its members is limited in his liberty solely by the condition of his liberty concurring with the liberty of every other member."¹ And what is the maxim of the State, according to Kant? It is summed up in the celebrated formula: "Treat every man as an end in himself, not as a means to an end."

tion to "absolute" or "despotic." We are not to be taken as implying that the Conservative party are pledged to despotism, or, indeed, as expressing any party views whatever.

¹ Kant, *Metaphysische Anfangsgründe der Rechtslehre*. Cited by Biermann, *Staat und Wirtschaft*, i. 79. Berlin, 1905.

Thus, for Kant, the very conception of the State is an essentially moral one, and based on the categorical imperative. It is the same for Fichte: "Limit thy liberty by the concept of the liberty of all those persons with whom thou comest into contact," he says.¹ Disciple as well as master saw in the State only a means to an end, and that end is the protection of the individual. It is to protect individual rights against the *Willkürherrschaft* of State despotism that Kant proclaims the necessity of *Rechtsgesetzen*. And let it be remarked that neither Kant nor Fichte saw in the individual anything but the individual *per se*. There was no thought of the strong individual, or of the fittest and his survival. On the contrary, the whole idea of the *Rechtsstaat* is based on the idea of the protection of the weak; it is in order to safeguard the interests of those who are not strong enough to defend themselves if left to their own resources that the *Rechtsgesetze* are to be created—as solemn guarantees of individual right.

It is on this idea of the *Rechtsstaat*, of the impregnable and sacred rights of the individual, that the whole polity of Liberalism is avowedly based. According to Kant, the essential attributes attached to the quality of citizenship are, in the first place, *liberty*, or the faculty of obeying only those laws to which the individual has himself consented; in the second place, *equality*, which consists in the recognition of superiority only in those on whom one can impose certain judicial obligations, in exchange for the obligations which they have the right to impose on others; and, in the third place, *independence*, which consists in the fact that one is dependent on oneself alone for one's existence and maintenance.² This being the ideal, what were the means by which Liberalism proposed to realise it? With unanimous accord the philosophers and economists of

¹ Fichte, *Die Grundlage des Naturrechts in Werke*, iii. 10. Berlin, 1845.

² Kant, *Rechtslehre in Gesammelte Werke*, vol. v., pp. 145-149 (first edition Hartenstein). Leipzig, 1838-39.

Liberalism came to the conclusion that the ideal of the *Rechtsstaat* would be realised by the fullest liberty of individual competition, naturally combined with the reduction of the State to a purely passive rôle. "Without any intervention of law, therefore," declared Adam Smith, the genial founder of the school of classical economy, "the private interest and passions of men naturally lead them to divide and distribute the stock of every society, among all the different employments carried on in it, as nearly as possible in the proportion which is most agreeable to the interest of the whole society."¹ The same belief is expressed by John Stuart Mill, who lays stress on the ethical element. "The perfection," says Mill, "both of social arrangements and of practical morality would thus be to secure to all persons complete independence and freedom of action, subject to no restriction but that of doing no injury to others."² This idea of free and unlimited competition between the individuals of the same State became a fundamental dogma of orthodox economic Liberalism. And yet economic Liberalism, even in its most advanced form, that of the Manchester school, is the direct descendant and heir of the Liberalism of the *Rechtsstaat*. The foundation of both is individualism; and the *raison d'être* of both was the excessive absolutism of the States of the eighteenth century, whose traditions were the traditions of the Middle Ages. For the eighteenth-century monarch, for the puny princes of petty States as much as for Frederic the Great, or Louis XV., or Joseph II., the individual did not exist. The State—that is to say, the personal rule of the ruler of the State—was the only thing that counted. The English school of Liberal economists, with Adam Smith at their head, owed much to the French Physiocrats, to Turgot and Quesnay; and the doctrines of the latter were, in turn, inspired by that current of individualistic thought which took its rise with Montesquieu.

¹ Adam Smith, *The Wealth of Nations*, iii. 215.

² J. S. Mill, *Principles of Political Economy*, p. 129 (people's edition, 1893.)

The individualism of Liberal economists was begotten by State absolutism.

But the Liberal economists, while extolling unlimited competition, held more or less vaguely to the ethical ideal derived from the teaching of the *Rechtsstaat* philosophy. According to Ricardo "this pursuit of individual advantage is admirably connected with the universal good of the whole."¹ Convinced of this absolute identity of individual and social interest, the Liberal economists loudly sang the praises of unrestricted competition. According to Bastiat, this principle of unrestricted competition is infallible, and "il n'en est pas de plus féconde en harmonies sociales, de plus bienfaisante dans ses résultats généraux."² And again: "Il est évident que la concurrence c'est la liberté. Détruire la liberté d'agir c'est détruire la possibilité et par suite la faculté de choisir, de juger, de comparer; c'est tuer l'intelligence c'est tuer la pensée, c'est tuer l'homme."³ John Stuart Mill, re-echoing Bastiat, declared that "instead of looking upon competition as the baneful and anti-social principle which it is held to be by the generality of Socialists, I conceive that, even in the present state of society and industry, every restriction of it is an evil, and every extension of it . . . is always an ultimate good."⁴

Thus, Liberalism considers the individual as being possessed of certain rights with regard to the community. As Herbert Spencer expresses it, "it results that to recognise and enforce the rights of individuals is at the same time to recognise and enforce the conditions to a normal social life. There is one vital requirement for both. . . . The life of a society, in whichever of two senses conceived, depends on the maintenance of indi-

¹ Ricardo, *Principles of Political Economy and Taxation*, p. 114 (Gonner's edition, 1895).

² Bastiat, *Les Harmonies économiques*, p. 352. Paris, seventh edition, 1879.

³ *Ibid.*, p. 350.

⁴ J. S. Mill, *Principles of Political Economy*, p. 477.

vidual rights. If it is nothing more than the sum of the lives of citizens, this implication is obvious. If it consists of those many unlike activities which citizens carry on in mutual dependence, still this aggregate impersonal life rises or falls according as the rights of individuals are enforced or denied.”¹ Each individual, according to the Liberal theory, must be free to develop his personality to the utmost of his ability. In this endeavour he must not be impeded by the State or by any external power whatever. And this proposition, that every man must be free to develop his personality to the utmost, necessarily implies that he must recognise every other man’s right to do the same. But, obviously, if the development of a man’s personality is to be left solely to his own initiative; if the life of society is to be carried on by a conflict of individual interests, it is very evident that those who are less able to carry on the conflict, who are weaker, will be trampled down and suppressed by those who are fitter and stronger. And such, indeed, Spencer tells us, will not only be the result of Liberal individualism, but it constitutes the whole object of that polity. Spencer would fain see the development of a strong society at the expense of the weak members of society. The great theorist of Manchester Liberalism never tires of asserting this eradication of the weak to be the object of social polity. “The well-being of existing humanity, and the unfolding of it into ultimate perfection, are both secured,” says Spencer, “by that same beneficent, though severe, discipline to which the animate creation at large is subject; a discipline which is pitiless in the working out of good; a felicity-pursuing law which never swerves for the avoidance of partial and temporary suffering. The poverty of the incapable, the distresses that come upon the improvident, the starvation of the idle, and those shouldering aside of the weak by the strong, which leave so many in shallows and miseries, are the

¹ Herbert Spencer, *The Man versus the State*, p. 102. Williams and Norgate.

decrees of a large, far-seeing benevolence.”¹ Here we are far from the imperative which Kant, the founder of philosophic Liberalism, enunciated as a maxim for the State: “Treat every man as an end in himself, not as a means to an end.”

To recapitulate what we have said so far, we may say that two fundamental ideas underlie Liberal polity—the rights of the individual as an individual, and the unrestricted competition between individuals. The second condition is supposed to render the fulfilment of the first condition possible. Let us briefly inquire whether these two fundamental notions of Liberal polity are consistent with each other.

Every individual, according to the tenets of Liberalism, brings into the world with him certain inherent rights—rights which he is possessed of as an individual, as a citizen of the State. According to Kant as we saw, these rights are summed up in the ideas of liberty, equality, and the faculty of disposing of his welfare as he please; and this doctrine of Kant’s is that of Liberalism in general. Individualism, according to Dietzel, is constituted, as a philosophy, by the combination of all those social theories which regard the individual as an *end in himself*, and all the social institutions, such as the family, the professions, the State, the different religions, the law, morality, as means created for the benefit of the individual, by whom they are preserved and modified.² Thus, every individual is possessed of rights as individual and citizen; and the first of these rights, as we have seen, is the freedom to develop his personality to the utmost of his power, in the manner in which he thinks best. But every individual being possessed, as individual and citizen, of a similar right, it follows that the rights of the different individuals mutually limit each other. Here, then, we meet with a restric-

¹ Herbert Spencer, *The Man versus the State*, p. 67.

² H. Dietzel, article *Individualismus* in *Handwörterbuch der Staatswissenschaften*, vol. v., p. 564. Jena, 1892.

tion of the idea of integral liberty. Liberty is not integral, after all, in spite of the rhetoric of Bastiat. The liberty of each individual is restricted by the liberty of other individuals; liberty is to be complete, and subject to no restriction but that of not doing injury to others. But this is a restriction! Here we have a moral element introduced which completely alters the aspect of things. Bastiat declares that "*détruire la liberté d'agir c'est . . . tuer l'intelligence, c'est tuer la pensée, c'est tuer l'homme.*" But the *liberté d'agir*, once it is restricted by a moral element, however restricted in its turn that moral element may be, is no longer *liberté d'agir* except within certain well-defined limits. Thus, we find Liberal philosophy, though the voice of its most authorised exponents, of Kant and Fichte, of Adam Smith and John Stuart Mill—nay, even of Spenser himself, who sees in the development of ever greater altruism the outward sign and token of social progress—declaring that the liberty of every individual is limited by an ethical element—namely, by the duty of not infringing the liberty of others.

But Liberalism is also the doctrine of free competition. We have given some specimens of Bastiat's inflamed rhetoric in favour of free and unrestricted competition. The progress of society is directly dependent on competition. "Every restriction of it is an evil, and every extension of it is always an ultimate good," declares Mill. It is the lever of social evolution, and the sole duty of the State is to ensure the maximum of individual competition being carried on without least hindrance. But how reconcile this idea of unfettered and unrestricted competition with the ethical restriction of the liberty of each individual by the liberty of others? With amazing optimism, Adam Smith and Ricardo declared individual interests and social interests to be identical; and the former even imagined that the "private interest and passions of men naturally lead them to divide and distribute the stock of every society as nearly as possible in the proportion which is most agreeable to the

interest of the whole society." Kant, who was less optimistic than Adam Smith as to the natural goodness of men, introduced as a precaution his *Rechtsgesetze*, designed to maintain equity in social relations. But the *Rechtsgesetze*, we have seen, constitute a limitation of individual liberty.

What is, perhaps, more surprising than the optimism of Adam Smith and Ricardo, products of the eighteenth century which had brought forth Rousseau,¹ is the inconsistency of Mill; who, while declaring, on the one hand, that every restriction of competition is an evil, proclaimed, nevertheless, on the other hand, that the liberty of each is subject to the restriction that it must not infringe on the liberty of others. As if even the idea of that competition so dear to Mill was reconcilable with the ethical restriction which he added! In competition the strongest

¹ It is fortunate that the admirable series of lectures on Rousseau which M. Jules Lemaitre delivered at the Société de Géographie in Paris during the winter session 1906-07 have now appeared in book form. Never have the puerilities, the incoherences, the repulsive sentimentalism, of Rousseau's philosophy been exposed so mercilessly and in so masterly a manner as by M. Lemaitre, who sees rightly in Rousseau the father of nearly all the errors and perversions of our present-day civilisation. It is refreshing to see at last a Frenchman of European reputation exposing the hollowness of Rousseau's sophistries in Paris itself; and as admiration for Rousseau is still a dogma in the University, it is fortunate that M. Lemaitre should have been selected to lead the combat against this official dogma.

It is difficult for a biologist to speak with patience of the *Discours sur l'Inégalité*; it is equally difficult to understand the infatuation which the author of the *Confessions* has inspired in Europe, and not only in France. When we reflect on the ignominy of Rousseau's character; when we remember that he was capable of deliberately accusing a fellow-servant in a house where he was employed as valet of a theft of which he himself was guilty, in order to save himself; when we remember that he was capable of abandoning a sick and helpless companion on the road, because the latter was a burden; when we remember the supreme infamy with which Rousseau's name will always be associated, an infamy five times repeated—i.e., the successive abandonment of his five children; when we remember these salient traits of Rousseau's character, we cannot fail to ask ourselves with amazement how it was possible for such a man—a thief and a rascal, physically and morally degenerate, who died insane—to have exercised so extraordinary an influence.

wins. And the strongest will win only, he *can* win only, on the condition that he *does* infringe on the liberty of his opponent, that he *does* take advantage of his opponent's weakness in order to crush him. The victor in every contest, be it physical, moral, or economic, is always and necessarily *victor at the expense of the vanquished*. That is to say, the rights of the vanquished as individual and citizen have *not* been heeded: they have been disregarded. The victor is victorious, and draws advantage from his victory, not merely because he is an individual, but because he is the stronger individual. In competition, and by the very idea of competition, so far as there is any meaning in the word, it is not the rights of the individual which are considered, but the rights of the victor alone—the rights, that is to say, of the stronger. Competition puts a premium on the stronger, the better adapted, on those better fitted and better armed to carry out the struggle. The weaker go to the wall without regard to their supposed individual rights. And Herbert Spencer was only logical when he celebrated the beneficial results of the “poverty of the incapable,” and of the “distresses that come upon the imprudent,” and of the “shoulderings aside of the weak by the strong, which leave so many in shallows and miseries.” Poverty, distress, misery, *must* be the result of economic competition. We do not say that this economic competition is bad, or that the poverty and misery of the incapable are things to be avoided; but we do emphatically say that these results are inconsistent with the principle of the restriction of the liberty of each individual by the liberty of the others. Between the idea of competition, on the one hand, and the idea of treating every man as an end in himself, and not as a means, lies a gulf which is not to be bridged over; for these ideas are antithetical and mutually exclusive. Does the victor in a competition treat the vanquished as an “end in himself”? Does he not rather treat him as a means to an end, and that end his own triumph?

If each individual were in reality limited in his liberty of action by the liberty of action of others, there would be an end to all competition. A stronger man, whether economically or physically stronger, finding himself in the presence of a weaker opponent, would, if he acted on the maxim of Kant and Fichte, of Adam Smith and Mill, have to use language something like the following: "Here are you and I confronted with each other; I, being the stronger, must inevitably crush you in any competition between us. Competition between us signifies your ruin. But my liberty is limited by your liberty. Complete freedom of action, it is true, is assured me, but on condition that I do not use that freedom to injure others. The moral law gives me no rights on account of my superior strength. I am an individual like you, and I am bound to see in you, not a means of enriching myself, but a moral end in yourself. Therefore, I have no right to crush you." Obviously, were such language to be used—and, be it remembered, such language *must* be used if we are to remain true to the doctrines of the founder of philosophic Liberalism—competition would be out of the question. And what becomes, in this case, of Bastiat's exaltation of competition? Or of similar exaltations by all classical economists, from Mill and Spencer down to Yves Guyot, the only remaining defender of the pure doctrine of the orthodox school of economists.

Thus, Liberalism, as a theory, appears to contain within itself the germs of a fatal contradiction. On the one hand, it proclaims the rights of man; on the other, it extols struggle without restriction. On the one hand, it declares every individual, as an individual, to be possessed of certain inherent rights; on the other hand, it declares competition necessary in order to permit the strong to manifest their superior qualities, and they can do this only by ignoring the alleged rights of their weaker opponents; and it declares, further, that competition is beneficial in that it suppresses the feeble and unfit. On the one hand, it erects a monument to the Rights of Man considered as an abstract metaphysical

entity derived from Nature, and appertaining to every man for the sole reason that he belongs to the species of "Homosapiens"; on the other hand, it identifies Right with Might, and grants to the stronger, on account of their strength, the right to trample on the weak. On the one hand, it declares that the liberty of each is limited by the duty of doing no injury to others; on the other hand, it postulates the struggle for existence in all its rigour; it expresses the wish that the stronger shall emerge victorious, although they can do so only at the expense of the weaker whom they have crushed.

And in practice how has Liberalism fared? Is it not obvious that the examination of certain symptoms of social pathology which we have made, by showing us how deplorable a wastage of social energy is going on and ever augmenting, constitutes in itself alone a severe condemnation of the social régime under which such waste of social strength and such unequivocal proofs of organic deterioration are possible? Is it not equally obvious that the social régime of to-day is not based on the theory of the *Rechtsstaat*? And is it not evident that Liberal polity, far from keeping the promises made in its name by Adam Smith, by Ricardo, by Mill, by Bastiat, by Spencer, has resulted in the most unrestricted of competitions, in which the economically weaker—who are not invariably or necessarily the organically inferior—go to the wall? And, instead of "the stock of society being divided as nearly as possible in the proportion which is most agreeable in the interest of the whole society," or "the pursuit of individual advantage being admirably connected with the universal good of the whole," do we not find, at one end of the social scale, unlimited wealth, and at the other unlimited misery? What has become of Mill's injunction to "restrict one's liberty by doing no harm to others"? Or of Kant's injunctions to treat every man as an end in himself, not as a means to an end? Or of Spencer's social altruism, in which he found the counterpart to

social competition ? Let us allow others to reply. "La libre concurrence," writes Professor Victor Basch, "n'a pas tenu ce qu'elle a promis. L'harmonie qu'elle avait prévu entre l'intérêt individuel et l'intérêt collectif ne s'est pas réalisée. Dans l'état social créé conformément à ce principe, dans la société capitaliste, ce ne sont pas nécessairement ni ordinairement les individus les plus méritants qui prospèrent et se multiplient d'avantage que ceux de moindre mérite. De plus la justice sociale y est à tout instant violée par le fait . . . que la misère immeritée dans laquelle naissent et vivent la majorité des autres, ne les empêche pas seulement de triompher dans la lutte, mais même de l'engager."¹ The influence of the prevailing social conditions, resulting from Liberal polity, on the upper classes is not better than on the lower. Professor Loria has very justly remarked that where the propertied classes live at the expense of the non-propertied classes, the former cannot possibly acquire any force : they are, on the contrary, spoiled by the very fact of their parasitism and inactivity ; whereas those who labour for the whole of society succumb as a result of overwork. In a competition waged under such conditions, individual superiorities have little, if any, chance of being developed, any more than individual inferiority has the chance of being eliminated, as it would be if it were left to its unaided resource, in accordance with the law of natural selection.² Spencer has himself remarked, in this connection, that "there still survives, though much weakened, the belief that it is honourable to do nothing but seek enjoyment, and relatively dishonourable to pass life in supplying others with the means to enjoyment."³ And the régime which has fostered the growth of this eminently anti-social spirit must be held responsible for its products. Let us turn to the result of the Liberal competitive

¹ V. Basch, *L'Individualisme Anarchiste: Max Stirner*, pp. 203, 204. Paris, Alcan, 1904.

² A. Loria, *Problèmes sociaux contemporains*, pp. 123 ff. Paris, Giard and Brière, 1897.

³ *The Study of Sociology*, p. 255.

system as it affects the wage-earning classes. Dr. Toulouse, the director of the *Revue Scientifique*, gives us the following picture of the results of our present polity: "For our country only (France), thousands of human beings aborted on the threshold of life, thousands of others born in miserable biological conditions, thousands of young people prematurely exhausted by factory work and incapable of becoming complete citizens, thousands of men rendered useless or killed as the result of an accident due to a moment of inattention caused by fatigue, thousands of working men tired out before the usual age-limit and excluded from the field of labour, henceforth unproductive and useless."¹ Professor Charles Gide informs us that "in England the result of numerous statistical calculations goes to show that the average length of life among the wealthy classes varies between fifty-five and sixty-five years of age; whereas it sinks to twenty-eight years and less for the working classes. In London . . . mortality varies from 11·3 per cent. in the opulent quarters to 50 per cent. in the indigent quarters."² And Professor Gide concludes that "the smaller the share which a man has in the wealth of the social aggregate, the greater is the ransom which he must pay to sickness and death."

These are only a few testimonies, culled at random; and their authors are not mob-orators or demagogues seeking to gain popular suffrage by means of inflamed harangue, but distinguished University Professors, men of international reputation in the world of thought, men certainly prone neither to misrepresentation nor to exaggeration. M. Paul Topinard speaks as follows of the conditions of social life to-day: "The tyrannical domination of a few over all the others, the few having all the advantages, the others all the misery; society divided up into classes, the strong at the top, the feeble at the bottom, the former having all the profits, the latter all the losses; and, what

¹ Dr. Toulouse in *Le Journal*, September 23, 1903.

² C. Gide, *Principes d'Economie Politique*, p. 417. Paris, tenth edition, 1906.

is more serious, the transmission from one generation to another of the results of the conflict, the responsibility from birth onwards for the conduct of the fathers, and the impossibility, or at least the great difficulty, of being released from the situation created by inheritance. . . . Everywhere the individual is bound by a number of rules which are doubtless indispensable, but which are profitable to some while injurious to others. At every step the individual finds himself opposed by barriers which prevent the full use of his faculties, and invalidate the results which he was led to expect as the result of his conduct.”¹ And the late Professor Ritchie derides the conception of the “beneficent private war, which makes one man strive to climb on the shoulders of another.” “Admirable, doubtless,” remarks Ritchie sarcastically, “this scheme of salvation for the elect by the damnation of the vast majority; but pray do not let us hear anything more about its beneficence.”²

Thus, here we revert to the conclusion previously indicated. The system of unrestricted competition, so extolled by orthodox economic Liberalism, is far from having produced those beneficent results which Adam Smith and Ricardo promised, and which Mill and Spencer still believed in; individual interest is far from being harmonised with the collective interest; the property of society is far from being distributed as nearly as possible in the proportion which is most agreeable to the whole society. Far from all this, we find a society in which the most extraordinary wastage of social energy is the rule—in which, on the one hand, idleness and parasitism, on the other hand overwork and misery, are the rule; and of which, whatever else may be said of it, it certainly cannot be said that the principles of the *Rechtsstaat*, of philosophic Liberalism, govern its polity. Does the capitalist look upon the working man as an end in himself, or as a means to

¹ P. Topinard, *L'Anthropologie et la Science Sociale*, pp. 362, 363. Paris, Masson, 1900.

² D. Ritchie, *Darwinism and Politics*, p. 6. Swan Sonnenschein, 1901.

the end of increasing his capital ? Does the capitalist restrict his liberty even to the bare extent of doing no injury to the liberty of others ? We have here examined the results of Liberal polity merely from a theoretical standpoint. Its practical results may be judged from the statistics given in the second part of this work. We might dwell at greater length on the immense wastage of social energy and the corresponding loss of social cohesion, the consequent disintegration of society, which cannot fail to result from the anarchy which, as a result of Liberal polity, prevails to-day. We might dwell on the strikes, and show, from their statistics, the enormous loss which they cause annually to the economic interests of the social organism. We might dwell on the conditions of life in all our great cities, which, in spite of many and great improvements, still remain a source of disease and social weakness. But here we will only examine the theory of Liberalism. And when we come to consider the many disasters which Liberal polity has prepared for the social organism ; when we consider the wastage and diminution of social energy which is its accompaniment ; when we consider the biological deterioration which it has brought about, we must not be surprised. A polity based on a theory so contradictory could not but result in incoherence and disintegration of social life.

Liberalism will either have to abandon the ethical element in its creed, or it will have to abandon the *laissez-faire* element. The Liberal party in England, which contains the elastic Nonconformist Conscience, and which, at the same time, is pledged to *laissez-faire*, contains in itself an inherent contradiction. The Nonconformist Conscience, which has been described as the greatest humbug of modern times, cannot bear the spectacle of Chinese labourers imported to work in South Africa ; but it subscribes to a political dogma which, if true to itself, is condemned to complete sterility in social legislation, which is responsible more than anything else for the social disintegration with which we are menaced, and which would be content not to

stir a finger to help those who are in "shallows and miseries" at home. There are abundant signs—and Spencer recognised them—that Liberalism is abandoning the *laissez-faire* for the ethical element, and that it is abandoning Adam Smith and Ricardo, Mill and Spencer, in order to return to the idea of the *Rechtsstaat* of Kant and Fichte. But if Liberalism candidly adopt as its creed the policy of social intervention in favour of the economically weak, of social legislation for the working classes; if it adopt the ethical maxim of considering every individual as an individual—that is to say, as an end in himself, and not as a means to an end—in this case Liberalism must *cease to be Liberalism*; it must become Socialism or a form of Communist Anarchism. For Socialism and Communist Anarchism, let it be remarked, are political and social doctrines which are consistent with the ethical imperative which commands us to treat the individual as an end in himself, and not as a means to an end. And it is notable that the founder of philosophic Liberalism, Kant himself, individualist though he was nominally, was in reality the precursor of modern Socialism.¹ Kant was a Socialist, because his ethical creed was essentially a *Gemeinschaftsethik*—an ethic, that is to say, which transcended the individual, and gave to individual duty the sanction of a social imperative. It would lead us too far were we to examine Kant's social ethics in detail. It suffices, for our present purpose, to reiterate the statement that, if Liberalism is to remain true to the idea of the *Rechtsstaat*, if it is going to inaugurate an era of social polity based on the fundamental idea that the individual is an end in himself, and that therefore each individual's activity is to be limited by the conception of the liberty of each other individual—in this case it is not an individualist but a socialist polity with which Liberalism will be identifying itself; and this socialist polity means the end of *laissez-faire* and of the whole doctrine of Liberal economics.

¹ Vide K. Vorländer, *Kant und der Sozialismus in Kantstudien*, iv. 362-404. Hamburg and Leipzig, 1900.

If, on the other hand, Liberalism is to remain true to the doctrine of free competition and to its consequences—the victory of the economically stronger, and the elimination of the economically weaker—then it must definitely dissociate itself from any ethical elements which limit the liberty of the individual. But in this case, likewise, Liberalism ceases to be Liberalism ; it adopts the creed of individualist Anarchism, based on the rights of the stronger ; and its masters will be, in this case, not so much Adam Smith or Ricardo, Mill or Spencer, who tempered their glorification of unrestricted competition by a more or less diluted injunction to respect the rights of others, or by dissertations on the harmony of individual and social interests, as Max Stirner and Friedrich Nietzsche, the apostles of the Super-Man, of egoism, of the triumph of the strong, and of the ruthless elimination of the weak. In both cases Liberalism, as a theory, will have proclaimed its ineffectiveness ; in either case it will be the bankruptcy of Liberalism.

CHAPTER III

SOCIALISM AND SCIENCE

HAVING arrived at this point of our study, it may be well to pause a little and consider the conclusions at which we have arrived. In the first place, we have seen that the law governing the evolution of the whole organic world is the law of selection ; among species, with the exception of those few modifications effected by the direct action of the environment, every transformation which is hereditary is the work of selection. And we have also noted that the idea of natural selection, as it first occurred to Darwin and Wallace, has been completed and rendered more profound by the idea of germinal selection, due to Weismann. The admirable work of Weismann has shown us that the struggle for existence begins among the primordial living elements, which constitute the basis of all life ; and, from this beginning onwards, as we follow the general transformation of life and the growth of species, we see everywhere the same struggle, begotten of the same fundamental conditions of existence—namely, that more individuals are born than can survive ; the result of the struggle, under normal conditions, being always the sole survival of those best adapted to the circumstances of life. As we proceed from the domain of the lower organic forms, and follow the course of evolution through the history of human society, the same conditions present themselves ; and a closer scrutiny of this eternal conflict which we see all around shows us that it is necessary, in order to maintain a standard once attained and to ensure unbroken progress.

A further scrutiny reveals the fact that, in the wonderful economy of Nature, the continuance of this conflict, so indispensable to progress, is ensured by the most fundamental tendency of life itself—the tendency to expand. Under conditions which result in a greater number of individuals being born than can survive, expansion necessarily implies conflict; and thus the continuance of the condition under which alone life, as we know it, is possible is assured by the very fact of life, which is synonymous with expansion.

Turning our attention more particularly to social evolution, we endeavoured, by a study of certain phenomena of social pathology, to ascertain the nature of the particular forces underlying this evolution and shaping its ultimate developments. While fully recognising the tendency which manifests itself to-day in a greater degree of humanitarianism, we saw that this altruistic tendency is confined to a very limited sphere of our social legislation; and that, even within these narrow limits, the altruistic tendency has mainly mistaken its aim, and resulted in the creation of an artificial process of counter-selection; and this, far from securing the admission of an ever greater number of capable individuals into the sphere of competition on equal terms, very often causes the capable members of the community to be sacrificed to the incapable, and immediate suffering to be relieved at the cost of greater future suffering. And we saw, further, that the greater part of the field of social evolution has not been affected by the altruistic tendency, and that the conflict is marked by the predominance of excessive individualism, a phenomenon particularly noticeable in the universal and constant augmentation of the rate of suicide. We saw that altruism is, properly speaking, incompatible with the idea of conflict, which implies the clashing of individually antagonistic interests; but that, on the other hand, the progress of the race is dependent on a widening of the sphere of competition on equal terms, and, consequently, on a removal of the obstacles set up by our

economic development to the entrance into the lists of combat of the masses ; who have hitherto, to a considerable extent, been precluded from even engaging in the strife.

It is at this point that there arises an apparent contradiction, which has been insisted on by Mr. Benjamin Kidd. What is the factor which determines this widening of the sphere of competition so beneficial to the race ? For those who, for economic reasons, are interested in restricting to the utmost a competition in which their purely artificial position would in all probability be shaken, there is no rational sanction for extending the limits of the competition ; because their personal interest in the present must, from a purely rational standpoint, outweigh any non-personal interest of the race in a hypothetical future. But, on the other hand, the figures which we quoted concerning the augmentation of social wealth, and its distribution among an ever-increasing number of persons, are in themselves sufficient to show that the standard of life of the community is being raised, and that what were once the domains of privilege are being thrown open to a growing host of new-comers ; in a word, that the sphere of competition within society is being widened, and competition thereby becoming ever keener. Now, if there be no rational sanction for the realisation of a condition essential to race progress, where are we to find the force which has determined this realisation ? According to Mr. Kidd, this force is none other than the ethical influence of the religion peculiar to Western civilisation, with the origin and development of which it is so intimately bound up. But we saw that the sphere of action of altruistic influences in social evolution is very limited even now ; and, further, that it is impossible to seek the motive power of a development which must result in an extension and accentuation of individual conflict in an ethical influence diametrically contrary to the nature of this development ; for individual conflict necessarily implies a condition of things which is the antithesis to altruism. This apparent dilemma is

persons, cannot be spoken of as a. True, the tendency of such a mere of conflict, and thus to bring under the operation of the law of allent; but any development which it needs be accompanied by counter directions which must counter- of Western civilisation since the ed to increase conflict, without ividual life staked in that conflict; those phenomena of social pathology question before us is, therefore, *increasing the actual tendency to widen sing at the same time the value of life?* h to the French Revolution, and competition is the outcome, has evolution of society has outgrown economists, as well as those of the Rousseau school. The intellectual ed to a former phase of evolution, ty in its present condition. And is not surprising considering the of the maxims on which it was e maxims of the *Rechtsstaat*; on nited competition and the victory has proved during its reign that of which we spoke.

ed a new doctrine, which, we are om the action of the very forces on. For Karl Marx and Mr. Kidd to the inevitable nature of the ue, Marx foresees the advent of e action of purely economic forces; e advent as the result of the action

solved, however, if we keep well in mind the fact that expansion is the elementary condition of life. If a race can exist only on condition that it expand, and that no obstacle be placed to its expansion, it is more than probable that any such obstacles will be removed as the result of intrasocial developments. If the potentialities of Western society can no longer be contained within the bounds of the restrictions placed on its further expansion by economic conditions, Western society will overstep the bounds and follow the path of expansion. If an individual intelligence, in its need of expansion, can no longer be contained within the bounds of former beliefs, these bounds will be overstepped, and the road of free thought and unchecked expansion will be followed thenceforth. If Western society arrives at a point of economic, intellectual, and social development, when it outgrows the limits within which its need of expansion, suited to a former phase of evolution, was satisfied ; then those limits must be extended if society is not to be suffocated. And such an extension results simply from the working of an irresistible tendency inherent in all life, which impels every being and every race to expand in such measure as its constitution allows.

But we also reached the conclusion that the conflict so necessary to progress is not at present being waged under the conditions most likely to ensure benefit to the race. This conclusion necessarily results from the arguments developed above. We showed that the progress of a race must be judged from the double point of view of its social fitness and of its organic or biological fitness ; and neither the altruistic influences at present at work, nor the individualistic tendencies engendered by our economic conditions, nor those economic conditions in themselves, are favourable to the culture of either social or biological superiority.

The question then naturally arose as to the remedies for this state of affairs. For even the development of which we spoke, though it has brought about a distribution of social wealth among

an ever-increasing number of persons, cannot be spoken of as wholly beneficial in its nature. True, the tendency of such a development to widen the sphere of conflict, and thus to bring a larger number of persons under the operation of the law of selection, is in itself most excellent ; but any development which tends to increase conflict must needs be accompanied by corresponding developments in other directions which must counter-balance it. The development of Western civilisation since the French Revolution has tended to increase conflict, without increasing the value of the individual life staked in that conflict ; and its results may be seen in those phenomena of social pathology which we have studied. The question before us is, therefore, *What force is best adapted to increasing the actual tendency to widen the sphere of conflict, while increasing at the same time the value of life?*

Liberalism, which gave birth to the French Revolution, and of which the actual régime of competition is the outcome, has proved itself a failure. The evolution of society has outgrown the doctrines of the Liberal economists, as well as those of the doctrinaire philosophers of the Rousseau school. The intellectual products of these schools, suited to a former phase of evolution, cannot be assimilated by society in its present condition. And this bankruptcy of Liberalism is not surprising considering the wholly contradictory nature of the maxims on which it was founded—on the one hand, the maxims of the *Rechtsstaat* ; on the other, the maxims of unlimited competition and the victory of the stronger. Liberalism has proved during its reign that it is *not* the great social force of which we spoke.

In its stead we are offered a new doctrine, which, we are assured, results necessarily from the action of the very forces which determine social evolution. For Karl Marx and Mr. Kidd seem to be in agreement as to the inevitable nature of the coming transformation. True, Marx foresees the advent of Socialism as the result of the action of purely economic forces ; whereas Mr. Kidd foresees its advent as the result of the action

of purely ethical forces. And the Socialism of Karl Marx is not by any means the Socialism of Mr. Kidd; for whereas the former means by Socialism a condition of affairs in which the action of those developmental forces which have given rise to all progress—the forces of conflict—will be suspended, Mr. Kidd aspires to a state in which these forces shall reach their maximum; although it is hard to understand how this is to come about as a result of the growth of the softening ethical influences of Christianity. But Mr. Kidd's ideal is also a vague Socialism, and this Socialism is, in the eyes of that distinguished sociologist, as much a necessity as the Socialism of Karl Marx is for him, even if the nature of the determining forces be different. Karl Marx foretold many years ago that the Socialist régime would be the inevitable outcome of that system of economic contradictions created by capitalism.

"In the measure that the number of potentates of capitalism, who usurp and monopolise all the advantages of this present phase of social evolution, diminishes, the misery, oppression, slavery, degradation, and exploitation, but also the power of resistance, of the labouring classes increase concurrently. These classes are always augmenting their numbers, and tend to become more and more disciplined, united, and organised by the very mechanism of capitalist production. The monopoly of capitalism becomes an obstacle to the very mode of production which has developed and prospered with it and through it. The socialisation of work and the centralisation of its material resources both reach a point at which they are unable any longer to be contained in their capitalist envelope. This envelope will burst. The death-knell of capitalist property has sounded. The expropriators will be expropriated in their turn."¹

One of the most authorised exponents of Marxism at the present day, Karl Kautsky, in a recent work, has prophesied the same thing. Kautsky recognises the imperative necessity of expansion inherent in the capitalist mode of production, as in every other form of life, and he writes :

"La nécessité de l'extension constante du marché a encore pour conséquence un autre fait important : il est clair que le mode de production

¹ Karl Marx, *Das Kapital*, Zweite Auflage, 1872, vol. i., p. 793.

capitaliste devient impossible à partir du moment où le marché ne s'étend plus dans la même mesure que la production, c'est à dire des que la sur-production devient chronique. . . . Voilà une situation de laquelle, si elle se présente, résultera inévitablement l'avènement du socialisme. On doit en venir à une telle situation *si l'évolution économique continue à progresser jusqu'ici*, car le marché extérieur comme le marché intérieur a ses limites, tandis que l'extension de la production est pratiquement illimitée." ¹

Let us, for the moment, take these assertions of Karl Marx and of his disciple Kautsky as grounded in fact, and let us suppose the advent of Socialism to be inevitable. The question at once arises, Does Socialism constitute the force which is best adapted to increasing the actual tendency to widen the sphere of conflict, while at the same time increasing the value of life ?

In the first place, we may remark that it is a grievous error to think that Socialism has been disposed of when we have denounced it as the ideal of highway robbery or spoliation. No, an ideal which has been capable of moving the masses of the people all over Europe, as Socialism has done ; an ideal which has produced among its adherents a spirit of devotion, of self-sacrifice on behalf of a cause, such as Socialism has produced, is not an ideal to be lightly dismissed with a few scornful words. M. Bourdeau, who is by no means a Socialist, in a very interesting book published some twelve years ago on German Socialism and Russian Nihilism, tells us that the receipts of the German Social Democratic party amounted in a single year, 1890-91, to the sum of 223,266 marks (about £11,163). Of this amount private subscriptions accounted for 168,645 marks (£8,432). This sum may not appear great to the accountancy departments of the Conservative or Liberal parties, among the component elements of which are peers, wealthy landed proprietors, county gentry, finance magnates, and *grands industriels* ; but it is certainly immense when we remember that it is contributed by the working man, for whom every halfpenny counts. M. Bourdeau tells us that this sum, which constitutes the

¹ Karl Kautsky, *Le Marxisme*, pp. 266, 267. Paris, 1900.

receipts of the central office of the party, by no means represents all that the working man gives in order, to support his cause, for the local receipts are not less than those of the central office ! And M. Bourdeau concludes : " Quel témoignage du désintéressement, ou du moins de l'esprit de sacrifice de la classe ouvrière en faveur de sa cause, que ce zèle à fournir l'obole du prolétaire, même en des temps difficiles." ¹

But while fully recognising the admirable organisation and the admirable devotion to their cause which characterise the Socialist party in Europe, we must approach the question in a scientific way, and ask ourselves, Does Socialism constitute the force we need for reorganising our social life ?

Socialism, as we said in the previous chapter, is the logical consequence of the teaching of the Liberal philosophers ; it is the logical consequence of the theory of the *Rechtsstaat*. If we admit the principle of equality between men ; if we admit that every individual is possessed of certain inalienable rights as an individual ; and that every individual is to be treated as an end in himself, and not as a means, then we must, logically, come to the Socialist and Communist ideal. It is religion which alone can afford us another outlet ; but we shall revert to this in the next chapter. Socialism and its counterpart, Communist Anarchism, are extremely logical doctrines, once certain premises have been accepted ; they are the *only* logical doctrines if we admit the suppression of the action of those developmental forces which have produced all progress up till now—the forces of conflict. " From every one according to his means, to every man according to his wants," is a logical precept in the light of such an admission. And Liberalism, in refusing to adopt this precept as its doctrine, is illogical. For Liberalism does not appear to perceive that the individualist doctrine of the most complete development of the individual—which development is the consequence of free

¹ J. Bourdeau, *Le Socialisme Allemand et le Nihilisme Russe*, p. 154. Paris, Alcan, 1894.

competition—is incompatible with the converse doctrine that the liberty of each is limited by the liberty of his fellows.

More logical than Liberalism, Socialism has erected the theory of the *Rechtsstaat* into a political creed ; it has drawn from this doctrine a political and economic system, the avowed object of which is to suspend the action of those developmental forces which have given rise to all progress up till now.¹ The increasing competition between individuals has hitherto been the main developing force underlying social evolution. But the Socialist régime, assuming its advent to be inevitable, will put an end precisely to this competition ; it will give to all according to their needs ; it will abolish poverty. It will be the object of Socialism, in the words of Kautsky, to see that “ the worker is secure in his existence, even when not in work.”² And the late eminent geographer, Elisée Reclus, expressed the ideal of communism when he wrote :

“ Beyond the mere ideal of daily bread and of material comfort, beyond the glitter of that social wealth which the cultivation of the soil will produce, we see rising above the distant horizon a new

¹ It may be objected that this assertion is not true ; and, as a matter of fact, we notice that M. Georges Renard, one of the most distinguished theorists of Socialism in France, and now Professor at the École Polytechnique, writes in a recent book : “ Une sélection des meilleurs, portant non plus sur quelques privilégiés, mais sur tous les membres de la société, est désirable pour le bien de chacun et de la société tout entière. Elle laisse subsister la libre concurrence avec ce que cette émulation a de stimulant pour l'activité et de fécond pour le progrès général et particulier ; seulement, en égalissant entre les concurrents les conditions du combat, elle empêche la lutte pour la vie d'être faussée dans ses résultats. Elle permet à une élite de se former, mais à une élite réelle, non plus factice et nominale ” (*Le Régime Socialiste*, p. 10, Paris, fifth edition, 1905). Nevertheless, with all respect for M. Renard, his views are not those of pure Socialism, the object of which is, by suppressing the struggle for existence, to put an end to the suffering which it entails. And, further, if the communistic theory of the State be put into practice, this struggle is rendered impossible.

² Karl Kautsky, *The Social Revolution and on the Morrow of the Social Revolution* (English translation, Twentieth Century Press, 1903).

world, in which we shall be able to fraternise with each other and satisfy freely all our aspirations. . . . It is then that each one will be able to follow his own path without let or hindrance ; the worker will accomplish the task which is most suited to his tastes ; the student will pursue his researches without any after-thought ; the artist will no longer sell his ideal of beauty for money ; and all of us, henceforth friends, can unite for the realisation of the great things which have been sung by the poets.”¹

Such being the ideal of Socialism, what is its value judged according to the criterion we have proposed ? In the first place, it is obvious that it is not a force adapted to increasing the actual tendency to widen the sphere of conflict, seeing that the object of the communist State is to suppress conflict. From this first point of view, therefore, Socialism does not satisfy us. But, on the other hand, it may be asked, if Socialism suppresses the action of the developmental forces of every phase of social evolution up till the present, does it thereby increase the value of life ?

The reply cannot be other than negative. The ideal of communism is essentially the resultant of an ideal which is still more fundamental—that of the natural goodness of man. Take up any work of a communist theorist, be he a Social Democrat like Kautsky, or an Anarchist like Reclus or Kropotkine, and we find this fundamental idea at the root of every dream of social reorganisation, of every conception of the communist society of to-morrow. But this idea of the natural goodness of man is not founded in biology ; still less is it founded in the history of human evolution, whose blood-stained spectacle unveils itself before us in the annals of history. And, although the faith of Reclus in the future is, in many respects, a very admirable faith, it is, nevertheless, the faith of a pessimist. It may sound strange to speak of pessimism in connection with one known for his optimism with regard to the future ; but it is

¹ Elisée Reclus in the Preface to *La Conquête du Pain*, by P. Kropotkine. Paris, Stock, 1902.

necessary to glance at the future in which Elisée Reclus so firmly believed.

The very idea of life, as we have said, implies expansion ; and as the conditions of life are such that more are born than can survive, this expansion entails conflict ; and, in its turn, conflict is the condition of all progress, and the means by which a level, once attained, can be maintained. It is thus in the nature of things that life should expand ; and conflict is one of the chief forms of expansion adopted by life for the fulfilment of this primordial law. If we suppress conflict, we not only suppress the means by which progress is achieved and by which progress alone can be maintained, but we suppress one of the chief outlets for the expansion of life. We restrict the sphere of life by restricting the sphere of its expansion. We thus render life poorer ; we reduce its vitality, and greatly limit its possibilities of evolution.

But this is an ideal which renders life poorer, which reduces its vitality. Is it not the faith of a pessimist, of one whose belief in the value of life is not sufficiently great to tempt him to realise the possibilities of life ? For one who believes in life, who believes that life possesses a value, the great object will be to realise the *maximum* amount of life possible. The lover of life, the believer in life, will seek the greatest possible expansion of life ; for him life is worth a conflict ; for him strife and suffering are in themselves beautiful in so far as they serve to beautify and strengthen life, to pass it through the flame from which it shall emerge as molten gold ! But he who shrinks from conflict shrinks from one of the main conditions of vital expansion ; he is content to lead a life which shall entail no effort. For him life is not worth fighting for ; it is not worth suffering for ; it is not worth the effort which strife implies ! In one of his most eloquent passages Nietzsche has vehemently protested against the Socialist ideal of the greatest happiness of the greatest number :

"You would, if possible—and what 'if possible' can be more absurd?—abolish suffering. And we? It seems as if we desire it to be yet harder and more intolerable than ever it was before. Comfort, as you understand it, is not an aim. Viewed from our standpoint, it is the *end* of all things, a condition of affairs which would render man contemptible, and lead us to sigh for his total disappearance. It is in the school of suffering, of *great* suffering—is this, then, unknown to you?—it is under the rule of this hard taskmaster, that humanity has realised all its progress. This tension of the soul which stiffens itself under the stress of suffering, and learns to become strong; this shudder which overtakes it in the presence of a great catastrophe; its ingenuity and courage in enduring, in interpreting, in utilising misfortune—has not all this been acquired in the school of suffering? Has not the soul been shaped and modelled by great suffering? There is in man a *creature* and a *creator*; there is in man something which is matter, which is fragmentary, superfluous, unclean, chaotic; but there is also in man something of the creator, of the sculptor, of the hardness of the hammer, of the contemplation of the artist, of the joy of the seventh day. Do you not understand this antagonism? And do you not understand that *your* pity goes out to the *creature*, to that which must be broken, moulded into shape, torn, burned, passed through the flame, purified by the edge of the sword, to all that which *necessarily must suffer*, which is made to suffer? And *our* pity—do you not understand to whom it goes out, inversely, when it endeavours to shield itself against the results of your pity, as against the worst of weaknesses and crimes? Thus, we have pity *against* pity."¹

And let it not be imagined that the idea of conflict is restricted to the employment of brute force. Certainly, we believe—and we hold that history justifies our belief—that nations need war and conflict, not only in order to effect their expansion, but also to maintain a high level of superiority. It is not a mere paradox which Zarathustra uttered when he bade his listeners "love the short peace better than the long," and when he exhorted them to regard peace "as a preparation for new wars."² National welfare, like individual development, is subject to the same inexorable law of struggle, which must be undertaken in order to effect the survival of the fittest and to prevent the degradation below a level once attained. But we here take the word "conflict" in its widest significance, as meaning not only the conflict

¹ F. Nietzsche, *Werke*, vii. 180, 181. Leipzig, 1896.

² *Ibid.*, vi. 67.

between nations and between individuals of the same nation, but within the soul of the individual himself. And we say that Socialism, in so far as it aims at reducing the amount and intensity of conflict in the world, not only infringes the primordial law of progress, but destroys, or at any rate greatly diminishes, the value of life. It cannot be otherwise ; as we have said, the continuity of the condition under which alone life, as we know it, is possible is assured by the very fact of life itself, which is synonymous with expansion. In the measure, therefore, that we restrict the operation of the primordial condition of life, we diminish life both in quantity and in intensity. The value of life is intimately bound up with conflict, as conflict is the chief means of expansion, and expansion is the first necessity of life.

The breath of pessimism—nay, of nihilism—is breathed forth by Socialism. And when we come to consider more closely some elements of social evolution, this spirit of pessimism will not astonish us. As those forces which have been most actively associated with the building up and expansion of Western civilisation gradually diminish in strength, a contrast reveals itself ever more and more clearly between the world in which we live, which we *are*, and the world of our ideals. The force which has contributed most to the evolution of Western civilisation—the ethical aspect of that civilisation apart—is, as we saw in the second part, Christianity. But the hold of Christianity over civilisation has been steadily diminishing during the last hundred and fifty years. The Reformation, which destroyed the unity of the Church, was the first grave symptom of the disintegration of Christianity in Europe ; and the events which have followed, the virulent attacks of the French Revolution, and the less virulent but more profound undermining of old faiths by modern science—all these were but a logical sequence of the Protestant Reformation ; which latter, considered as a factor in the disintegration of Christianity, and therefore, indirectly, in the disintegration of that civilisation which was mainly the work of

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Christianity, may be regarded as one of the most untoward events in history. The force which created the basis on which Western civilisation was built up, which for ten centuries represented Western civilisation against Moorish and Turkish barbarism, and which was the living symbol of its growing strength and expansion for a like period, has been steadily undermined. Western civilisation, having developed other forces during its evolution, would seem to have outgrown the one which constituted its original basis.

But the student of social evolution can now perceive that the industrial forces, which have been developed by Western civilisation, and which have so enormously increased the intensity of social life and social metabolism, have not been able to replace the older religious force as factors of social integration. On the contrary: in proportion as social metabolism has increased in intensity, social disintegration has increased likewise; and this phenomenon becomes more apparent when we look at the figures concerning the rate of suicide. Thus, we have arrived at a state of complete incoherence of the social organism—on the one hand, a growing intensity of social metabolism; on the other hand, growing social disintegration. It is evident that, as this incoherence of the social organism increases, the contrast between the world which we know and which we are, and the world of our ideals and aspirations, must ever tend to become accentuated. It is the appreciation of this disparity between the actual world and our ideal which is the ultimate source of the pessimistic undercurrent which finds expression in the communist theory of the State. Western civilisation is, as it were, deprived of the basal force which formerly held its heterogeneous elements together. This ancient force, constituted by Christianity, has lost its hold over the masses, but it has not been replaced by any other which responds to the fundamental need of society for integration. In a word, Christianity coincided with the tendency to widen the sphere of conflict—for it was Papal Christianity which was the

chief instrument of the expansion of European civilisation—while, at the same time, owing to its nature, it enormously increased the value of life ; for life, viewed from the Christian standpoint, was no longer a mere speck of dust in the eternal rhythm of evolution and dissolution, but every life had its value and its eternal sanction ; whereas to-day, on the one hand, modern industrialism, though its tendency is to develop conflict, does not tend concurrently to increase the value of life ; and, on the other hand, Socialism responds to the popular perception of this failure to give value to the individual life. But, in seeking to escape from this regrettable consequence of industrialism, Socialism endeavours at the same time to destroy the other main tendency of our present system to develop conflict, which is a beneficial tendency. Socialism thus renders the state of affairs doubly bad. In seeking to escape from the regrettable consequences of industrial development, it threatens the fundamental conditions of life itself ; and it overlooks the real cause which lies at the root of this tendency of industrial development to diminish the value of life.

For it is evident that if the greatest sum of life be sought in a condition of things in which the developmental tendencies necessary to the expansion of life are greatly restricted, if not altogether suspended, the sum of life aimed at will be at best a very meagre one ; and if the sum of vitality be reduced, the value of life will be reduced at the same time. Vain the conflict ! Useless the struggle ! Meaningless the suffering of the world ! The ideal is a life of calm, of repose, in which the existence of all is comfortably assured. But the life of storms, of struggle, and of suffering can alone be the *full* life. The life which has never forsaken its harbour of shelter and rest, which has never embarked on the stormy seas of the unknown, which has never had to confront great perils, which has not been moulded into shape by great suffering—such a life is incomplete ; and, being incomplete, its value must be less.

discussing the ethics of that school of Protestantism which is farthest removed from orthodoxy, the school represented in Germany by Harnack and Pfleiderer. This school, under the impression that an ethical code based on the idea of an anthropomorphic deity is a code built upon a quicksand, has sought to detach ethical laws from their religious basis, and to establish them on a "natural" basis. "But on what is one to found one's sermons of morality?" asks Hartmann. And he replies: "Evidently the preacher will be reduced to appealing to the moral tendencies and instincts of man. If these are sufficiently developed, the appeal will succeed, but it will have been superfluous; if they be not sufficiently developed, the moral discourse will be an object of derision and scorn, and it will be very difficult for the preacher to demonstrate even theoretically to his deriders that they are wrong. For, as a matter of fact, the latter likewise appeal to instincts and tendencies of the human heart; and in order to decide which are to be preferred, whether love or hatred, forgiveness or revenge, self-sacrifice or egoism, are to guide our actions, the preacher has again no other means at his disposal than to appeal to the feelings or to the taste, things which differ in different individuals. Once it is detached from metaphysics, an ethical system remains suspended, as it were, between heaven and earth; such a system can put forth its decrees, but it is reduced to impotency if the individual does not happen to find these decrees to his taste. Without metaphysics an ethical system is but the natural history of the human tendencies and instincts, considered in their social results. Such a system may claim to be the criterion of human actions; but it is unable to justify its claim if rebellious egoism demands its title-deeds."

The philosopher who wrote this was not himself a believer, but a disciple of Schopenhauer. But what Hartmann has very clearly seen is the futility of the efforts which have been made to establish an ethical system on a "natural" basis. Morality

clearly implies the subordination of the personality of the individual to an exterior power. The moral imperative, if it be obeyed, clearly implies that the individual recognises something higher than his own individual instincts and tendencies ; for otherwise why should he seek to hold these instincts in check ? And the great service which Max Stirner, a philosopher unfortunately unknown in England, has rendered to philosophy, is that he pitilessly pointed out the real nature of the moral law, which consists in a *subordination of the individual to an exterior power* ; and it was precisely for this reason that Stirner rejected all moral law. The result he arrived at, the preaching of an unbounded and ferocious Egoism, which is the negation of every ideal other than that of the individual, is entirely logical.¹ Hartmann has rightly said that Stirner's book is valuable, in that it depicts the logical consequences which follow, not only from the doctrine of unlimited economic competition, but also from every ethical system which seeks to base an ethical code on non-metaphysical principles.

Every ethical code implies the same fundamental principle of the subordination of the individual ; whether the obedience of the individual to certain moral precepts be required in the name of the moral law, or of society, or of religion, or anything else, the principle remains identical. The individual is required to subordinate his own personality, his own instincts, his own tendencies, to an entity which is exterior to and higher than the individual. This is so obvious that we need not discuss it any further ; and this fact being granted, it only remains to be seen whether it is more efficacious to require the subordination of the individual in the name of a rational or of a supra-rational principle.

We do not see how the argument of Hartmann can be done away with. We are unable to see any valid reason why man,

¹ Max Stirner, *Der Einzige und sein Eigentum* (Berlin, 1843). J. F. Mackay, *Max Stirner, sein Leben, sein Werk* (Berlin, 1898).

left to himself and obeying his reason alone, should prefer to keep his natural instincts in check rather than to gratify them. The idea of the natural goodness of man, as we have said, is founded neither in biology nor in history; and the fundamental tendency of life, that of expansion—and expansion, under existing conditions, implies conflict—is such as to develop egoistic and individualistic instincts at the expense of the social instincts, unless this fundamental tendency be counteracted at the same time by other tendencies working in an opposite direction. Is science the source which nourishes these counteracting tendencies? During the comparatively short phase of human evolution which history records, we have often seen the underlying instincts of the human animal break forth with ferocious violence, when the integrating principle which assures the cohesion of society has been dissolved; the break-up of the Roman Empire, the French Revolution, the Commune of 1871, show us what results from the anarchy following on a temporary dissolution of all the supra-social principles which guarantee social stability. Society is held together only in so far as certain supra-social principles which guarantee its stability are recognised. When these supra-social principles, from one cause or another, fall into discredit, when the natural ethics of man, derived from the promptings of his own instincts, are allowed free play without any restraint, we fall into that social anarchy which must eventually bring about the downfall of a nation surrounded by other societies whose cohesion is intact.

If appeal be made to society as the source from which this principle of social cohesion which we call morality is derived, appeal is being made once more to rationalism for the explanation of a principle which is essentially supra-rational. For there is nothing to prevent a given society having conditions which are not conducive to the cohesion of that society. In our Western civilisation to-day it is not the principle of social morality which

could prevent the exploitation of the many in the interests of the few. And, above all things, society as such is not capable of giving that value to individual life which a supra-rational principle can give. Thus it does not respond to the second condition which we deemed essential to the constitution of a social force. It is true that there are individuals who are capable of working and of dying for society, who are content with that fragile immortality which consists in living as a hero in history. But this historical immortality is the lot of the very few; and when society comes and claims from the toiler whose humdrum life brings him but little profit and little happiness, the sacrifice of a greater individual profit in the interests of society, in the interests of the race to come, that toiler might reply that the hypothetical interests of the race to come are not *his* interests; and what superior principles could society then invoke? In requiring a sacrifice of immediate interests in the name of interests which are not immediate, peremptory reasons must be given, reasons which transcend the reason of the individual, which are imperative, which admit of no discussion, which are supra-rational. Otherwise it will always be a question of the conflict of interests; and when the individual interest comes into conflict with the social interest, the latter must be sustained by a principle which is imperatively convincing. To be convincing, it must, in return for the sacrifice of immediate individual interest, confer a value on individual life which is not only immediate but permanent.

The problem of the division of labour shows us this more clearly. As Herbert Spencer has said: "While rudimentary, a society is all warrior, all hunter, all hut-builder, all tool-maker; every part fulfils for itself all needs. Progress to a stage characterised by a permanent army can go on only as there arise arrangements for supplying that army with food, clothes, and munitions of war by the rest. If here the population occupies itself solely with agriculture and there with mining, if these

manufacture goods while those distribute them, it must be on condition that in exchange for a special kind of service rendered by each part to other parts, these other parts severally give due proportions of their services. This division of labour, first dwelt on by political economists as a social phenomenon, and thereupon recognised by biologists as a phenomenon of living bodies, which they called the physiological division of labour, is that which in the society, as in the animal, makes it a living whole.”¹ The division of social labour requires a quantity of life to be spent unremuneratively, from the social point of view, in order that the higher spiritual interests of society may continue to subsist. In order that science, whether theoretical or applied, in order that art and philosophy, in order that any of the higher branches of human culture may be developed, leisure is necessary ; it is necessary that the scientist or the artist or the philosopher be supplied with the substances necessary to physiological existence ; it is thus necessary that there exist a number of persons who manufacture and distribute these substances ; and, below these persons, it is necessary that there exist a number of individuals to do the scavenger’s work of society, so to speak. We will not assert that the manufacturing and distributing system as we know it to-day is a *conditio sine qua non* of higher social culture ; for the modern industrial system was unknown to the Athenians, as it was unknown to the Romans ; and yet the intellectual culture of Athens and Rome was superior to that of our present-day civilisation. But it is certain that the division of labour was as accentuated in Athens and Rome as in our Western civilisation. The Athenian Republic produced immortal genius because the physiological requirements of life were met by a vast army of slaves ; similarly, Rome was a republic, and subsequently a world-empire, based on slavery. In

¹ *The Principles of Sociology*, i. 440. It is scarcely necessary to recall the fact that the first scientist to establish the principle of the physiological division of labour on an empirical basis was Milne-Edwards.

proportion as the physiological complication of organisms increases, division of labour increases likewise ; for whereas in the *Amœba* a single cell suffices for all the vital functions, including reproduction, in the *Vertebrata* we find differentiated organs for locomotion, respiration, digestion, reproduction, thought, etc. And, similarly, in proportion as the complexity of social organisms increases, the differentiation of social functions increases also ; and if we take a single social function we find similar differentiation going on within this function. Whereas formerly the philosopher laid claim to the knowledge of everything ; to-day each branch of the hierarchy of sciences, beginning with mathematics and ending with sociology, requires that those who would be adepts in it should specialise in that single branch, and within each branch we find a similar division of labour. In sociology alone we find economics, ethnology, criminology, jurisprudence, statistics, ethics, and political science, each claiming its own specialists, and requiring the study of a lifetime. In every division and subdivision of vital functions, whether physiological or psychological, whether the organism be an animal or a society, everywhere we find growing differentiation of labour accompanying growing complexity of structure.

But if we admit that this division of labour is necessary to the existence of a highly-developed society, it is clear, as we have said, that a quantity of life must be spent unremuneratively in order that the superior spiritual interests of society may continue to exist. One of the greatest objections to the Communist theory of the State is that intellectual culture would be impeded in such a State ; for Communism, be it Socialism or Anarchism, aims at the raising of the status of manual labour at the expense of intellectual labour ; and as the Communist State would not be likely to remunerate intellectual labour more highly than manual labour—its avowed object being the suppression of personal profit as the mainspring of social activity—it is more than probable that the advent of Communism would be the beginning

of a lowering in the standard of intellectual culture.¹ And this very phenomenon, of the division of labour constitutes an unanswerable objection to the Communist theory of the State. But the division of labour, we say, requires sacrifice, for the lives which must, according to its principles, be spent unremuneratively are sacrificed for the higher interests of society ; they are condemned by the nature of things to be spent in humdrum toil and obscurity ; and it is not for such as these that the immortality of historical fame is reserved. We speak of the "higher interests" of society, and of the "nature of things." But for those who are required thus to sacrifice themselves—of what interest are these "higher interests" to them ? And may they not reply that such may be the "nature of things" under existing social conditions, but that they will reverse these existing conditions, and create conditions in which this sacrifice of their own personal interests is not required ? Of course we may reply that such a society would be an impossibility ; that, even were the Communist State to be formed, it must speedily disappear ; we can demonstrate scientifically that the division of labour goes hand-in-hand with increasing complexity, and that once an organism, be it animal or social, has attained a certain degree of evolution, it cannot subsist without such a division. And, further, we may point out that the division of labour in the social organism requires the sacrifice of numerous parts in the interest of the whole ; and as sacrifice necessarily entails suffering, the division of labour in the social organism requires suffering. All this we may point out, but we forget that what a scientist can understand, the labouring man can sometimes not understand. Any appeal to social solidarity would meet with

¹ We say nothing as to the degradation of the level of intellectual culture which must result from the suppression of the liberty of opinion. Whoever knows what Socialism means in France and in Germany to-day knows that the tyranny of the Communist State would exceed the tyranny of a Nero or a Cæsar Borgia, while lacking the artistic proclivities of the former and the genius of the latter.

the same reply as an appeal to the individual reason. The elements of society which are condemned to suffer as the result of the division of labour which calls upon them to perform the less interesting and less remunerative tasks, have no "social" interests to serve in maintaining such a state of affairs; their social instincts must coincide with their individual instincts, and both must urge them to create social conditions from which this division of labour is excluded.

Every man, it is said—we think that M. Bourgeois, the former Prime Minister of France, was the first to say it—is bound by certain obligations to society, which constitute a sort of semi-contract. Every man is a debtor to society for the progress, both material and intellectual, which has been achieved before his time. But, in the first place, while we do not dispute that civilisation has produced great material and intellectual progress, we have to ask whom this progress has most greatly benefited? Has the working man derived as great a benefit from the invention of the steam-engine, or the telegraph, or the automobile as the capitalist? Has he, more especially, derived great benefit from the scientific work of Darwin or from the genius of Wagner? And if we grant that the economic conditions to-day are largely to blame for the biological deterioration observable in modern civilisation, it would, nevertheless, be folly to attempt to remedy these by the introduction of conditions which would infringe the primordial law of life—that of expansion. But if we are thus compelled to retain such conditions as the division of social work, which is essential to all social life beyond a certain degree of evolution, we shall always have a certain amount of life which will be sacrificed in accordance with this condition. It is not only the division of labour itself, it is also the condition, more fundamental still, of natural inequality which requires a certain amount of sacrifice. This inequality is a law of Nature. True; but you cannot expect the victims of this sacrifice to recognise the necessity for it, *unless*

you give to the sacrifice a supra-rational sanction. The mere appeal, in the name of the higher interests of society, to the social instincts of those compelled to do the unremunerative work of society, will always elicit the same reply: those higher interests of society are not our interests, and our interests are for us primary.

Thus it seems to us that the appeal to the interests of society as the basis of a social constitution in which full play is to be allowed to that condition which we have termed primordial—namely, the widening of the sphere of conflict—is wholly insufficient. For the conflict so necessary to social expansion implies inequality, and inequality implies a corresponding division of labour; and this division of labour, which requires the sacrifice of some in the interests of the whole, cannot be justified in the eyes of those who suffer from it, unless a supra-rational sanction be shown for this sacrifice. But the appeal to the interests of society is an appeal to a purely rational principle, which can possess no validity if its title-deeds be called in question by those who find it irrational.

We cannot, therefore, concur in the view which sees in society itself the principle which assures the integration of the social organism. The appeal to the social instincts by themselves is like the appeal to individual reason; neither the social instincts alone, nor the individual reason alone, are capable of providing a sanction for the conditions indispensable to social progress or stability. These conditions, if they are to be efficient, must possess a supra-rational sanction. Science, the late Professor Berthelot has declared, claims the right to assume the moral, intellectual, and material guidance of society. In other words, science *alone* exists; science alone is competent to provide for the welfare alike of the individual and of society, for the power which assumes the moral, intellectual, and material direction of society must needs assume that of the individual components of society;

and if science is to assume the moral, intellectual, and material direction of society, what is left for religion, or metaphysics, or any other factor? But is science capable of satisfying our condition? Is it the force best adapted to increase the existing tendency to widen the sphere of conflict, and to increase at the same time the value of life?

As to the first condition, science is undoubtedly capable of satisfying us. Indeed, we may go further, and say that it is in science that human life has found one of the great sources of its expansion; not, indeed, the only source, but a very fertile one nevertheless. It is since the development of the applied sciences that the sphere of social conflict has widened so immeasurably, while the nature of the conflict has increased in intensity. Science has created our Western civilisation as we know it, has extended the power of man over Nature, and has caused an ever greater number of persons to be enveloped in the sphere of social conflict, and thus brought under the beneficial sway of the law of selection. True, certain discoveries, notably of medical science, have been applied in a manner which is not conducive to the physical welfare of the race; but science itself cannot be held responsible for the applications which man makes of it. We have already quoted Macaulay's celebrated passage from his essay on Francis Bacon, in which he so eloquently describes some of the triumphs of science; but it is needless to dwell on these achievements of the applied sciences; they have been made familiar to us, not only by the facts of our everyday life, but by the books of eminent writers; and these achievements of the applied sciences constitute one of the noblest expressions of the expansion of the human mind. Nothing has done so much to increase the intensity of social conflict while widening its sphere as the steam-engine, the machine, and the telegraph-wire, and the claim of science to the material direction of society is fully justified.

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We cannot, therefore, concur in the view which sees in society itself the principle which assures the integration of the social organism. The appeal to the social instincts by themselves is like the appeal to individual reason; neither the social instincts alone, nor the individual reason alone, are capable of providing a sanction for the conditions indispensable to social progress or stability. These conditions, if they are to be efficient, must possess a supra-rational sanction. Science, the late Professor Berthelot has declared, claims the right to assume the moral, intellectual, and material guidance of society. In other words, science *alone* exists; science alone is competent to provide for the welfare alike of the individual and of society, for the power which assumes the moral, intellectual, and material direction of society must needs assume that of the individual components of society;

and if science is to assume the moral, intellectual, and material direction of society, what is left for religion, or metaphysics, or any other factor? But is science capable of satisfying our condition? Is it the force best adapted to increase the existing tendency to widen the sphere of conflict, and to increase at the same time the value of life?

As to the first condition, science is undoubtedly capable of satisfying us. Indeed, we may go further, and say that it is in science that human life has found one of the great sources of its expansion; not, indeed, the only source, but a very fertile one nevertheless. It is since the development of the applied sciences that the sphere of social conflict has widened so immeasurably, while the nature of the conflict has increased in intensity. Science has created our Western civilisation as we know it, has extended the power of man over Nature, and has caused an ever greater number of persons to be enveloped in the sphere of social conflict, and thus brought under the beneficial sway of the law of selection. True, certain discoveries, notably of medical science, have been applied in a manner which is not conducive to the physical welfare of the race; but science itself cannot be held responsible for the applications which man makes of it. We have already quoted Macaulay's celebrated passage from his essay on Francis Bacon, in which he so eloquently describes some of the triumphs of science; but it is needless to dwell on these achievements of the applied sciences; they have been made familiar to us, not only by the facts of our everyday life, but by the books of eminent writers; and these achievements of the applied sciences constitute one of the noblest expressions of the expansion of the human mind. Nothing has done so much to increase the intensity of social conflict while widening its sphere as the steam-engine, the machine, and the telegraph-wire, and the claim of science to the material direction of society is fully justified.

It is not in the sphere of practice alone, but in the domain of

theory also, that science has constituted, and will continue to constitute, one of the highest forms of human expansion. Conflict, as we have said, is to be understood not merely as meaning the employment of brute force, but as including the conflicts which take place within the human breast; for these are none the less intense because they are invisible, and they constitute a factor in human evolution, the importance of which it would be difficult to over-estimate. And to this intensifying of an important factor in the progress of the human intellect theoretical science has contributed the lion's share. If the intellectual condition of the Middle Ages may be described as being the agreement of the ignorant, the present condition of intellectual development is that of the disagreement of the thoughtful; and this second phase of intellectual development, inestimably beneficial to intellectual progress, has been brought about chiefly by the discoveries of science in its theoretical domain, as distinct from the domain of applied science. By causing disagreement, science has stimulated thought; by stimulating thought it has stimulated discovery; and thus it has contributed powerfully to that wonderful expansion of the human intellect which we have witnessed in the latter half of the nineteenth century.

To take a single conspicuous example, let us turn to the science of Life—to biology. Comparative physiology, which embraces all the phenomena of life, from the lowest animals up to man, is a triumph of the nineteenth century. Passing from the great work accomplished by its founder, Johannes Müller, we come to the researches of Schleiden on the cellular composition of plants, and to those of Schwann on the cellular composition of animal tissue. Contemporary with the labours of Johannes Müller we find those of Von Baer, whose discovery of the ovum and of its development into a hollow sphere with liquid contents, the wall of which forms the slender germinal membrane (Blastoderm), laid the foundation of embryology. The dis-

covery of the relations between the ovum and the germ-layers which arise from it, and the tissues and cells which compose the fully-developed organism, was the next great step accomplished by embryological science ; and the discovery of K  lliker that the ovum is a simple cell, and that the numerous germinal layers which arise from it by repeated segmentation are the origin of all the cells, and consequently of all the parts of the finished organism, was one of the most fertile of biological discoveries. But it is the work of Darwin which forms the crowning-point of biological research in the nineteenth century. By his theory, as Haeckel has said, he brought all the results of the various biological sciences to a common focus, and thus gave them a harmonious interpretation ; and by his principle of selection, which is what we properly call Darwinism, he discovered the direct cause of those transformations of species which Lamarck, Goethe, and Erasmus Darwin had believed in without being able to afford a scientific justification of them.

It is on the lines indicated by Darwin that all biological research has been pursued during the last forty-five years, and with signal success. We need only refer to Huxley's contributions to comparative morphology and classification ; to Haeckel's work in similar spheres, and to his important discovery of the biogenetic law ; to Oscar Hertwig's fruitful researches respecting the nature of fertilisation ; to the all-important investigations in the domain of positive psychology, carried out by Wundt, Ribot, Sergi, Espinas, Fritz Schulze, and others, not omitting Flechsig, whose researches into the anatomy of the cerebral structure of the higher animals constitute one of the most valuable achievements of modern science ; and whose theory of the centres of association, or thought centres, although called in question by Sciamana at the Congress of Psychology held in Rome in 1905, nevertheless remains a remarkable contribution to positive psychology. And, in the last twenty years, we have had the

invaluable work of Weismann, who, with his theory of germinal selection, has completed the Darwinian theory of natural selection ; and whose theory of evolution, remarkable for its ingenuity and for the extraordinary command of anatomical and physiological knowledge possessed by its author, is the best attempt at a really scientific interpretation of organic progress.

We have briefly enumerated a few steps in the progress of biology during the nineteenth century ; but the same story could be told of every science. In the domain of astronomy, the new science of astrophysics, associated with the name of Zöllner, has been sectioned off ; we may mention, further, the discoveries of Sir W. Huggins respecting the velocities with which certain stars are approaching us and others receding ; and the researches which have been made concerning the physical constitution of the heavenly bodies, as well as their motions. In physics and chemistry, the discovery of the radio-active properties of matter, commencing with the investigations of Professor Röntgen, and followed by those of M. and Mme. Curie, of Professor Becquerel, of Professor Ramsay, and of Dr. Le Bon, have led to conclusions calculated to revolutionise our ideas as to the nature of matter and force. The new theory of matter tells us that the matter formerly supposed to be indestructible slowly dissolves itself as a result of the continuous dissociation of its component atoms ; that the products of the dematerialisation of the atoms constitute a category of substances which are intermediary, in their properties, between ponderable bodies and imponderable ether—that is to say, between two worlds which, up till now, have been considered as completely separated ; that the matter which we formerly supposed to be inert, and capable only of restoring the energy furnished it by the environment, is, on the contrary, a colossal reservoir of energy—of intra-atomic energy—and that it can act without any exterior stimulus ; and that it is from the intra-atomic energy manifested during the dissociation of matter that most of the forces of the universe, especially electricity and

solar heat, result.¹ Thus, in physico-chemistry, as in astronomy and biology, we stand to-day at a point undreamed of forty years ago. And in the abstract sciences, such as mathematics and logic ; in the concrete sciences, such as geology and psychology ; in the abstract-concrete science of sociology, in all its branches, whether ethnology or criminology, political economy or the history of religions, jurisprudence or statistical science, the progress is the same. Macaulay's words are as applicable to theoretical science as to applied science : " A point which yesterday was unseen is its goal to-day, and will be its starting-point to-morrow."

It is thus evident that science constitutes one of the highest forms of the expansion of the human intellect ; for all the steps which we have enumerated in the progress of science are likewise steps in the progress of human expansion. The conquests of the human intellect become ever more and more complete ; their sphere widens more and more every year ; and this implies a widening of the sphere of human expansion, and, at the same time, of the sphere of conflict. For the more the intellect expands, the more secrets of the universe science reveals, the greater is the tendency of those traditions which formerly constituted our intellectual inheritance, to be weakened ; and, as we have said, by coming into conflict with these traditions, science causes disagreement ; it thus stimulates thought, and creates new sources of energy for further human expansion.

Science thus responds fully to the first condition of a social force ; it not only allows, but it stimulates and develops, that expansion which is the primordial law of all life, and which is the first condition of progress. But does science respond to the second condition we have insisted on ? Does it, while developing the expansive power of life, at the same time increase its value ?

¹ For a lucid exposition and discussion of the new theory of matter see *L'Evolution de la Matière*, by Dr. Gustave Le Bon (Paris, Flammarion, 1905). Mr. A. J. Balfour has also discussed the question in his Presidential Address to the British Association at Cambridge, August, 1904. See also Professor R. K. Duncan's *New Knowledge*, 1905.

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At first sight it may appear as if the question were already answered in the affirmative ; for is not the value of life implied in its expansion, in the power of which its expansion is but the expression ? Science, it may be said, stimulates the expansion of life ; therefore, at the same time, it gives to life its value, because it gives it the means of gratifying its most ardent desire. And yet to reason thus is to leave out of account one fundamental fact, and this fact is the *insatiability* of life, an insatiability which is the counterpart to the need of expansion. Though science may partly gratify the desire of life for expansion, it cannot do so to the extent of satisfying it completely ; the greater the power of expansion, the greater the desire for it ; and the power of expansion must always remain less than the desire. Science stimulates the expansion of life, and it gives us means to realise this need of expansion which we did not formerly possess. But in proportion as our thirst for expansion is satisfied, it does but increase in intensity ; and the satisfying of this desire for expansion, which is none other than the desire for life itself, is beyond the resources of science. For science is, in the nature of things, relative. It can give us no insight into the deeper mysteries of existence, no reply to the wherefore of life, to the anxious *Wohin* and *Wozu*. Some seem to think it enough to proclaim that these things which science is unable to explain do not really concern us, that we have to do only with life as we live it, and that we have no concern with the things which are behind life. But this is a short-sighted doctrine. Every man, at some moment or other of his existence, must ask himself the reason of all this *Streben*, of all these efforts, of all this suffering which accompanies the life which is really lived. It is true that science has caused the mystery which formerly surrounded us to recede further and further. It is also true that it has substituted for the legend of creation and the miraculous interposition of a divine power, the great doctrine of evolution and the reign of law. But, however far it may have caused the

limits set up by ignorance to recede ; however far it may cause them to recede in the future ; there is, and will remain, a frontier which science can never cross. Of the existence of that frontier humanity is well aware ; and it is destined to see all its efforts dashed to pieces against this brick wall, even as the waves of the sea are dashed against the cliff and recede. We may call the mystery which is shrouded behind this frontier the Unknowable ; *but we know that there exists an Unknowable* ; we know that there exists a limit to the expansion of our intellect ; and this knowledge of the impotency of our efforts, coupled with the ardent thirst of our desire to unveil the mystery, must cause us to despair. For we see that the power of man *has* a limit ; and that, while our desire for expansion knows no bounds, because it is the desire of life which is insatiable, nevertheless, our power of expansion is ever confronted by a wall on which is written, "Thus far and no further."

M. Alfred Fouillée has well said that "Aucune formule de mécanique ou de physiologie ne fera comprendre pourquoi je jouis, souffre, désire."¹ And it is precisely this impotency of science to explain the *Wherefore* of life, of its desires and joys and sufferings, which prevents science from being the only factor which gives a value to life. Science *does* give a value to life, in that it enables life to realise its desire for expansion ; but, on the other hand, it counterbalances the benefit which it confers by preventing life from realising all those hopes which it has been the means of stimulating. As if in irony, science raises our hopes, stimulates our expansion, and then condemns us to see these hopes reduced to nothing, this expansion brought to a standstill, before the impassable barrier of the Unknowable. As Herbert Spencer has rightly said,² it is not by dogmatic assertions that science brings home to us the limits of the human

¹ A. Fouillée, *La Psychologie des Idées-Forces*, i. 129. Paris, Alcan, 1893.

² *Education : Intellectual, Moral, Physical*, p. 39. Popular edition, Watts and Co.

intellect, but by bringing us at every turn to frontiers which that intellect is unable to cross.

Thus we may emphatically assert that science is not the force calculated to give the greatest value to life, while developing the tendency to widen the sphere of conflict. On the contrary, science, having stimulated the expansion of life, brings that expansion to a standstill; having awakened hopes and aspirations, it condemns these hopes and aspirations to sterility; having created an ardent thirst for knowledge, it is unable to quench that thirst. The question of the value of life remains exactly where it was before the prodigious development of science in the nineteenth century. The old blind faith in science held by the Materialist school associated with the names of Ludwig Büchner, Karl Vogt, and Jacob Moleschott, has now gone; and the man of science realises, more than anyone else, how small is the much-vaunted human intellect in comparison with that which transcends the human intellect. Herbert Spencer was unquestionably right: the education which possesses the greatest value is science; for it is only by a study of the great problems of science, whether physico-chemical, or physiological, or psychological, or sociological, that we really understand the limits of our knowledge.

The pretensions of science to the moral and intellectual direction of human evolution are thus unjustifiable; the very fact of the Unknowable shows us that there exists a domain transcending the domain of science, and one over which science can have no authority. The claims of science to interfere in the domain of morality, of art, or of religion are null and void. We must always remember that the world possesses a depth which we cannot sound. It is precisely the "tension of the soul which stiffens itself under the stress of suffering and learns to become strong," which a physiological formula cannot explain to us; just as it cannot explain those overflowings of the soul which manifest themselves in every work of genius; just as it

cannot explain the Wherefore of suffering, which is the condition of progress ; all these, and many others, are things which illustrate the truth of Goethe's words when he told us that " wir still verehren dürfen, was unerforschlich ist." As Weismann has admirably said :¹

" If we follow up the truth without fear, we will always come to the conclusion, alike now and in the future, that a limit is set to our knowledge by the very constitution itself of our own mind, and that beyond this limit lies the domain of belief, which every one is free to conceive in the manner which he deems best. With regard to these ultimate factors, Goethe has given us the true formula when he let the Nature Spirit cry out to Faust : ' Thou dost resemble the spirit which thou conceivest, but not me.' Man must at all times repeat this to himself, but none the less does the necessity of an ethical system, of a religion, remain. The latter must only change its forms according as our knowledge of the world progresses."

These are not the words of a metaphysician, but of the greatest biologist which Europe has produced since Darwin. The progress of science has not annihilated religious belief, as some appear to think ; but religion is the complement of that expansion of life which science has done so much to stimulate and develop. It is religion which enables us to cross the frontier where science ends, which alone is capable of quenching that thirst for knowledge which science only renders more painful by awakening in us hopes which it is unable to fulfil. If the Wherefore of all that conflict and suffering which is the primary condition of progress cannot be answered by science, perhaps it can be answered by religious belief, which transcends the domain of science ; if the desire for expansion cannot find its realisation in science, perhaps it can find satisfaction in religious belief.²

¹ *Vorträge über Deszendenztheorie*, ii. 331. Jena, 1904.

² It may not be out of place, as we have quoted Weismann, to quote another master, who is as far apart from Weismann as the poles are asunder, but whom, nevertheless, we recognise as being in many ways our teacher in things philosophical. We refer to Nietzsche. No one was a greater adversary of Materialism than the author of *Zarathustra*. His attacks on Christianity spring from his great idealism. He writes

Thus, though science is a powerful factor in stimulating us to greater efforts, though its achievements represent an enormous expansion of the human intellect, nevertheless it is not the force capable, by itself, of securing social cohesion and stability, for it does not confer any value on life beyond a purely relative one; and the sanction for suffering, the sanction for effort, as we have said, must needs be more than relative. In proportion as science destroys those religious beliefs which have, up till the present, given a value and a meaning to life; while, at the same time, it exasperates our desire for knowledge, which is a form of our desire for expansion, by holding out hopes which its nature renders it incapable of fulfilling; in this proportion does science reduce the value of life, and destroy one of the main-springs of action. For action must be founded on belief: scepticism never leads to action; those men who have "moved great assemblies by reason and eloquence, who have put life into bronze and canvas, or who have left to posterity things so written that it shall not willingly let them die"—those were not

in the first volume of *Menschliches, Allzumenschliches* concerning the study of science:

"Die Wissenschaft giebt Dem, welcher in ihr arbeitet und sucht, viel Vergnügen, Dem, welcher ihre Ergebnisse lernt, sehr wenig. Da allmählich aber alle wichtigen Wahrheiten der Wissenschaft alltäglich und gemein werden müssen, so hört auch dieses wenige Vergnügen auf: so wie wir beim Lernen des so bewunderungswürdigen Einmaleins längst aufgehört haben, uns zu freuen. Wenn nun die Wissenschaft immer weniger Freude durch sich macht und immer mehr Freude, durch Vernächtigung der tröstlichen Metaphysik, Religion und Kunst, nimmt: so verarmt jene grösste Quelle der Lust, welcher die Menschheit fast ihr gesamntes Menschentum verdankt. Deshalb muss eine höhere Kultur dem Menschen ein Doppelgehirn, gleichsam zwei Hirnkammern geben, einmal um Wissenschaft sodann um Nicht-Wissenschaft zu empfinden: neben einander liegend, ohne Verwirrung, trennbar, abschliessbar; es ist diess eine Forderung der Gesundheit. In einem Bereiche liegt die Kraftquelle, im anderen der Regulator; mit Illusionen, Einseitigkeit, Leidenschaft muss geheitzt werden, mit Hülfe der erkennenden Wissenschaft muss der böartigen und gefährlichen Folung einer Überheizung vorgebeugt werden" (*Werke*, ii. 235, 236, Leipzig, 1895).

sceptics ; the ultimate secret of the influence of a St. Francis of Assisi, of an Ignatius Loyola, of a Calvin, or of a Giotto, a Michelangelo, or a Raphael—the ultimate secret of the influence of these men was their belief, and the fact that into all they did and said they put their whole heart and soul. But science, by its widening of the sphere of conflict and its concurrent inability to give to life an adequate sanction, must lead to scepticism ; and the fruits of scepticism are sterility and nihilism. Socialism, by reducing conflict, reduces vitality ; and by reducing vitality, reduces the value of life. And the development of science, or rather, of that materialist philosophy of science in favour to-day, must necessarily lead to the same result ; for it awakens hopes which it is incapable of satisfying ; it destroys consolations which it is incapable of replacing ; and thus it leads to scepticism as to the value of existence in general. Science must therefore be corrected by idealism, and *vice versa*. If our civilisation be essentially the work of science, we must not forget that idealism is the source from which all the energy necessary to the expansion of life is derived.

CHAPTER IV

RELIGION AS A SOCIAL FORCE

IN a previous chapter we remarked : " We shall come to the further conclusion that, although altruistic influences are not the primary force determining social evolution ; nevertheless, the religion of which these altruistic influences form the chief part is an indispensable factor in social development, because it alone is in a position to satisfy the *suprasocial* wants of man, to respond adequately to that need for expansion which transcends society itself."

In the course of the last two chapters we have been leading up to this conclusion. We have been unable to find either in Liberalism or in Socialism or in science itself the social force which fulfils the criterion which we have laid down, and which we believe to be in harmony with the essential conditions of progress—the force, namely, which tends to widen the sphere of social conflict and increase its intensity, while at the same time increasing the value of life. Science certainly constitutes one of the highest forms of human expansion, but it leads us at every turn to frontiers which we are unable to cross ; while stimulating our expansion, it also limits the possibilities of that expansion. And Liberalism, while advocating the unrestricted competition of all against all, gives us no value for the individual life thus staked in the conflict ; or else, if we follow up the lead of the school of philosophic Liberalism founded by Kant, we must logically arrive at the Communist theory of the State. And Communism, as we have seen, by restricting the sphere of

conflict, interferes with the primordial conditions of life, the value of which it reduces by reducing its vitality.

We are thus brought to the conclusion that the only factor which responds in an adequate degree to our criterion is religion. This conclusion may seem inconsistent with our admission that Christianity, and the ethical influences with which it is associated, are not universally necessary to the development of civilisation; a fact which is nevertheless proved by the growth and development of Japan. Or it may seem inconsistent with our combating of Mr. Kidd's idea that Christianity is the elementary force shaping the development of our Western civilisation. Yet, with regard to the latter objection, we may reply that, though we consider religion to be an essential factor in social development, we do not consider the influence excited by Christian ethics in the present age to be sufficiently great to warrant our ascribing to that influence social phenomena which may be ascribed to other causes. Neither does the fact that Christian ethics do not exercise sufficient influence prove that they *ought not* to exert a much greater influence than they actually do; it only proves that social evolution is not being directed into the channels most conducive to the ultimate welfare of the race. In the second place, it is an error to consider religion as necessarily synonymous with Christianity; even as it is an error to speak of civilisation as necessarily conterminous with the "white race." Thus, although religion may be an essential factor in social evolution, that religion need not everywhere be Christianity, although the latter is indispensable to Europe.¹

¹ Religion, in so far as it is a natural phenomenon, obeys the two fundamental laws of all development—those of evolution and adaptation. No organic or superorganic phenomenon shows us more clearly the working of the law of adaptation. Christianity is thoroughly adapted to the needs of Western civilisation, just as Buddhism is adapted to the needs of the populations of the East. It is regrettable that this great truth is not understood by those who, doubtless with the best intentions, seek to propagate Christianity among peoples wholly unable to assimilate either

The essential requisite of a social force is that it ensures the greatest possible integration and cohesion of society, and in order to do this, such a social force must bear the test of the criterion previously enunciated. The object of such a social force must be the increase of social power by the economy of social expenditure, by the cultivation of biological and traditional superiority. This social force, if it is to fulfil its primary function — namely, that of ensuring the maximum of social integration and cohesion—must envelop the individual in every moment of his existence ; it must give to the individual a supra-individual ideal which shall be always present to him, which shall shape all his actions, which shall confer a supreme value on his existence—a value which is restricted neither in time nor space. Such an ideal must not only be supra-individual ; it must be suprasocial, transcending society, whose sanction for individual action is insufficient. And, finally, and because of these preceding conditions, such an ideal must be supra-rational. For rationalism affords no sanction for individual suffering, or for all that conflict which is the essential condition of progress.

The only ideal which satisfies these conditions is the religious ideal. And it is to be remarked that the very civilisation of Japan, whose recent evolution has so greatly surprised some of us, which is held up to our especial admiration as being an Atheistic civilisation, is cemented, held together, and fortified precisely by a religion which has its roots deep down in the soul of the nation. It is not a religion with which we are familiar ; it may very likely be an Atheistic religion ; but Atheism itself can only hope to become a social force in so far as it forsakes those strictly rational principles on which it is based. We see the truth of this proposition illustrated by the case of Japan. In an admirable article which appeared in the *Times* of October 4,

Christian metaphysics or Christian ethics. A little scientific training would soon suffice to show the uselessness of missions, the theory of which is wholly incompatible with the law of adaptation.

1904, entitled "The Soul of a Nation," we find the following description of the religious force which the Japanese call "Bushido" and which constitutes the backbone of the nation, the matter which cements the framework of society :

"If we cannot adequately express all that 'Bushido' is, we can say what it is not. Take the average scheme of life of the average society of the West ; 'Bushido,' as nearly as may be, represents its exact antithesis. 'Bushido' offers us the ideal of poverty instead of wealth, humility in place of ostentation, reserve instead of *réclame*, self-sacrifice in place of selfishness, the care of the interest of the State rather than that of the individual. 'Bushido' inspires ardent courage and the refusal to turn the back upon the enemy ; it looks death calmly in the face, and prefers it to ignominy of any kind. It preaches submission to authority, and the sacrifice of all private interests, whether of self or family, to the common weal. It requires its disciples to submit to a strict physical and mental discipline, develops a martial spirit, and by lauding the virtues of constancy, courage, fortitude, faithfulness, daring, and self-restraint, offers an exalted code of moral principles, not only for the man and the warrior, but for men and women in times both of peace and of war."

It is evident that we have here all the essentials of a religion, of a suprasocial and supra-rational force, which binds men together, and which exalts the individual by setting before him an ideal which governs his whole life and his every action, which, in a word, transcends himself. For it is not rationalism which can lead the individual to subordinate himself to the race. On the contrary, the hyperexaltation of the individual reason which rationalism implies must lead to a corresponding hyperexaltation of the individual as the measure of all things ; and we see this to be really the case in Western civilisation to-day, where society is menaced with disintegration as a result of the excess of individualism. Let us consider some further results of "Bushido."

"Thirty-seven years ago Japan was a military empire, and the ruling class was that of the 'Samurai.' If they consented to the loss of many cherished rights when the modern revival of the nation began, and their consent was in itself a splendid practical illustration of 'Bushido,' they surrendered nothing of their tenets, and, while remaining essentially a warrior caste, spread abroad among all ranks of the people the code of ethics which had won for them their distinguished position in the past.

Some privileges they lost, but they took a noble revenge, and set about to level up the nation to their standard instead of themselves falling below it.

"The principles of 'Bushido' have always had an intellectual and literary basis; the claims of learning have been held in as great reverence by the 'Samurai' as feats of arms. . . . If 'Bushido' is intellectually aristocratic, it is politically and socially rather the reverse. Anyone can become a 'Bushi' by conduct in peace and valour in war; merit alone recruits and maintains its ranks. It is open to the highest and the lowest in the land to excel, since neither birth nor wealth is required; only personal worth and conduct. The Government, at the time of the Restoration, experienced the need for a moral basis for its system of education, and found in 'Bushido' and the tenets of the 'Samurai' a code applicable to all classes of the people."

And again :

"When the modern revival began in Japan, and men began to wander over the world in pursuit of science, it was feared that 'Bushido' would lose its influence, and that Materialism would dominate, owing to the multiplicity of things that had to be learnt. So firmly, however, was it embedded in the history of the people, and so energetic were those who held aloft its banners, that it has not been overborne, but has rather prospered with every material advance of the country. . . . Ill-starred indeed was Russia to have chosen a moment for the war, when upon the material foundation of modern science was superimposed the moral structure of an older age."

We have given a somewhat lengthy quotation, because no language could depict to us better the value, the significance, the indispensable necessity of a social force which guarantees the integration and cohesion of society. The greatness of Japan is not the result of its having rejected the supra-rational principles of a former age; quite the contrary. "The Government, at the time of the Restoration, experienced the need of a moral basis for its system of education, and found in 'Bushido' and in the tenets of the 'Samurai' a code applicable to all classes of the people." Is not this sentence full of significance? The material prosperity of Japan is based upon the idealism which centuries have sanctioned. This is precisely what Western civilisation lacks; the material prosperity which industrialism has engendered has not proceeded *pari passu* with the development of

those idealistic principles which cemented European society in the Middle Ages. Because science has raised the industrial prosperity of Western nations to undreamed-of heights ; because science has enabled man to extend ever further his domination over the untamed forces of Nature ; science has also considered itself to be in a position to assume, as Professor Berthelot has claimed, the moral and intellectual direction of society. But, in its endeavour to take the place of the ancient forces of social integration, in its endeavour to give to life an ideal and a value and a meaning, science, as Brunetière has said, has ended in bankruptcy.

What is the lesson which this bankruptcy of science teaches us ? Is it not, to use the words of the *Times* which we have quoted, that " upon the material foundation of modern science must be superimposed the moral structure of an older age " ? Is it not Auguste Comte himself, the founder of the Positivist school, who has spoken of " the happy and capital influence on the general perfectioning of our sociability which the proper introduction of a real spiritual power can exercise, indispensable institution of which all philosophers should be unanimous in desiring the reorganisation on an intellectual basis at once more direct, more extended, and more durable " ?¹ In our Western civilisation, to-day as always, if we wish to regenerate society, we must commence by reorganising its spiritual basis in accordance with the principle that the organic and material prosperity of society is dependent on an idealistic infrastructure more fundamental still.

The question then arises, Upon what basis can Western society be reorganised, so that its integration and cohesion be reaffirmed ? Professor Durkheim, from whom we have so largely quoted, and who is incontestably one of the most eminent of living sociologists, treats religion as a negligible factor, and he is by no means the

¹ A. Comte, *Cours de Philosophie positive*, v. 288. Paris, fifth edition, 1893.

only writer of eminence who does so. "We are preserved from egoistic suicide," writes Professor Durkheim, "only in proportion as we are socialised; but the religions can socialise us only in proportion as they withdraw from us the right to free inquiry. However, they have no longer, and in all probability will never have again, sufficient authority over us to be able to obtain such a sacrifice on our part. We cannot, therefore, count on them as a barrier against suicide."¹ We thoroughly agree with Professor Durkheim that, if the regeneration of society by religion is possible only on condition that religion withdraws from us the right of free thought and free inquiry, then all projects which aim at such a regeneration are Utopian. It is not in vain that Kant has lived; and no Church or sect could hope to institute an era of religious persecution since Kant wrote his *Critique of Pure Reason*. Free thought is the most precious legacy in our inheritance, and no power on earth can prevail against the spirit of liberty. But the question remains: Does the reorganisation of society by religion imply a retrogression, an abandonment of the right of free thought and of free inquiry?

Professor Durkheim appears here to have confused the spiritual with the civil organisation of society, and to suppose that all influence of religion on social life necessarily implies a theocracy. Religion, says Professor Durkheim, can only hope to socialise us in proportion as it deprives us of our right of free thought. But, without interfering in any way with free thought, cannot religion give a value to individual life by conferring on the latter an eternal sanction? Does the Japanese religion, then, interfere so gravely with the right to free thought in Japan? We are aware that it will be objected to us that the Japanese religion is, strictly speaking, not a religion at all, since it has no deities; but, none the less, if there are no deities, there is a "life of the dead" recognised by every "Bushi," and life there is dignified by a conception which is essentially supra-rational—that is to say

¹ E. Durkheim, *Le Suicide*, p. 432. Paris, Alcan, 1897.

religious—for it is not a purely rationalistic conception of life which has produced “Bushido.” In Japan we have the living instance of a nation which has attained a degree of efficiency in the material sphere unsurpassed by any Western Power, and whose whole progress, whose whole greatness, is based on a foundation which is supra-rational and religious. “Bushido” is a religion; for it constitutes a code of ethics which is imperative, and to be imperative, an ethical code must appeal to something beyond the individual, to something which is above the individual. It was not individual reason alone which induced the “Samurai” to renounce their privileges; it is not individual reason alone which impels the Japanese soldier or sailor to face death with that heroic contempt for which they are famous; it is the spirit of “Bushido” which has accomplished all this, and “Bushido” would not have accomplished this had it been only rationalistic.

Thus it seems to us that the example of Japan shows us that a society *can* be socialised—and socialised in the highest measure—by a supra-rational organisation, without the liberty or the material greatness of that society being in any way injured.¹ On the contrary, the material greatness to which Japan has attained is due to the admirable spiritual organisation of the Japanese nation; the efficiency which has so astonished Europeans is the fruit of that religion which governs the life of the whole nation, which guides the action of even the socially lowest individuals; and Japan affords the most conspicuous illustration of the truth of the dictum of Auguste Comte that “toute vraie réorganisation sociale devra commencer par l'ordre spirituel.”²

¹ It may be objected that a supra-rational organisation is not necessarily a religious organisation. But religion implies the principle of universality as distinct from that of individualism, and supra-rationalism implies also the appeal to a principle which is above the individual reason. This principle, however, must, if it be above the individual reason, necessarily make appeal likewise to universality as the only possible criterion, once individualism is recognised as insufficient.

² A. Comte, *Cours de Philosophie positive*, v. 541.

What Japan has done so well, cannot Western civilisation do also ?

We have already dwelt upon the fact that Western civilisation owes its expansion and institutions very largely to Papal Christianity ; and we must further remember the fact that Catholicism affords greater security against suicide than Protestantism does. The statistics which we have quoted concerning the phenomenon are indeed remarkable. There is not one single exception to this rule in any country the figures of which we have been able to obtain. These facts are of the highest possible significance from the sociological point of view. If we consider suicide as indicating a disintegration of social life, a weakening of the bonds which bind the individual to society, a diminution of the value of life ; then it is obvious that Catholicism must be a religion more greatly integrated, more stable, more efficacious in its hold over the individual adhering to it than Protestantism. And if Protestantism is less integrated than Catholicism, it must also be less efficacious as a social force.

It may appear strange to talk, in the twentieth century, of Catholicism as a social force ; at least, it may appear strange to some who, like the Freemasons and professional anti-clericals of France and other Catholic countries, have learnt nothing from history, and, above all, from the history of that Revolution of 1789 to which they invariably appeal. In England, anti-clericalism, as it is known in some countries on the Continent, is fortunately unknown ; but anyone who lives in a country like France, who knows from personal acquaintance what anti-clericalism is, must feel inclined to smile at the fears of Professor Durkheim that any increase of the influence of the Church may lead to the restriction of free thought. As if anyone could be further from free thought than the fanatics who, obsessed by the hatred of clericalism, oppress and persecute all those who venture to disagree with them ! Truly, the Socialist Party

which expelled M. Millerand for the offence of holding views not in harmony with those of the Central Committee of the party ; the freethinkers who organised the monstrous delation system in the French army, who spied on every action of those to whose houses they were invited, who watched over the prayer of the child and the church-going of the mother and father, who took advantage of this right of every man to commune with his God and to educate his children as he thinks fit, in order to ruin and blast that man's career ; the freethinkers who boast of driving thousands of men and women into exile for no other crime than that of wearing the garb of a monk or a nun ; who threaten, by the recent Law of Separation, to confiscate all the churches of France and to sell them to be used as music-halls ; how admirably are these *freethinkers* adapted to reorganise society without infringing on the right of free thought !¹

We prefer to turn from the short-sighted views of these controversialists to the more serene judgment of the founder of the Positivist school himself : " It is to the Positivist school, properly so called," wrote Auguste Comte, " however strange such a claim may appear, that the right appertains of pronouncing a final and equitable judgment on the Catholic Church, and of appreciating in a worthy manner, on the basis of a sound general theory, its indispensable and real participation in the fundamental evolution of humanity."² And he continues, further on, with regard to this participation of Catholicism in the evolution of humanity :

" The eminently social genius of Catholicism has manifested itself more especially in the constitution of a purely moral power distinct from, and independent of, the political power in the narrow sense of the word, and in the introduction of morality into politics. Up till that time the former had always been, on the contrary, essentially subordinated to the latter."³

¹ Of course, we do not by any means imply that Professor Durkheim is in the remotest way connected with this anti-clerical policy in France.

² *Cours de Philosophie positive*, v. 262.

³ *Ibid.*, 263.

We have here the judgment of a man who was not a Catholic ; of a man who set himself the task of constructing a system of positive philosophy from which all metaphysical speculation was to be rigidly excluded ; of a man who devoted all the resources of his extraordinarily fertile intellect to the reorganisation of society on a new basis, which was destined in the mind of its author to be at the antipodes of mysticism and metaphysics—which was destined to supplant the religious organisation which had decayed, and to replace it by an organisation founded exclusively on scientific induction. And yet we find this man, this founder of the Positivist philosophy, whose knowledge of history was unrivalled, borrowing the schema of his system from the Catholic Church ; we find him rehabilitating the Middle Ages ; we find him constantly appealing to the discipline and organisation of Catholicism. Nay, more, we find the system which he founded, this anti-mystic, anti-metaphysical, scientific system, ending finally in the most mystic of metaphysics ; we find it ending in a religion—a new religion, it may be, but a religion none the less. Thus it is that, starting from principles as wide apart as the poles are asunder, the fathers of the Church and the founder of the Positivist philosophy both arrived at the same conclusion as to the urgent social necessity of religion.

And this has happened not with Auguste Comte alone. Another philosopher, less profoundly erudite, perhaps, but certainly possessed of greater natural genius than Comte—we mean Friedrich Nietzsche—likewise set himself the task of annihilating Christianity, of annihilating God. Nothing can exceed in violence and in beauty of style Nietzsche's infuriated attacks on Christianity, "the one undying stain on humanity," as he fiercely denounced it, "the most perverse corruption of humanity." And yet we find Nietzsche, the sworn foe of Christianity ; Nietzsche, who by the mouth of his Zarathustra declares God to be dead ; Nietzsche, the Atheist, the scoffer, the hater of gods ; we find him, too, ending in a religion. It

is a "religion beyond and above the religions," true; but the ideal of the Super-Man, the worship of beauty, of strength, of courage, of loyalty, of chivalry, all of which were incarnated in this supreme ideal—all this constitutes a religion. Nietzsche placed before us an ideal of transcendent beauty—for Nietzsche is all artist, and everything which Nietzsche wrote was profoundly artistic—and this ideal of beauty was a religion, a religion requiring the sacrifice of the individual in the interests of the race, and having the welfare of the race as an aim. In other words, it was an ideal which transcended the individual; and, in truth, it transcended the race also; and it is no paradox to say that there has seldom been a more profoundly religious nature than that of Nietzsche.¹

We could multiply examples of this kind. Socialism, it has been said, is a religion; and we have heard of the religion of patriotism, of the religion of human suffering, and of various others. And all these may be called religions if we mean that they are reactions against the excessive individualism of the nineteenth century. All of them appeal to something higher than individual reason; all are, consequently, more or less supra-rational, although unintentionally so.

Thus we see that religion is still a force in society which has not yet lost all its old vitality. And if the religious spirit has survived all the storms and all the attacks which have been directed against it; if those who are most eager, either to supersede it by some new Positivist ideal, or to weaken it in one way or another, are compelled finally to arrive at the very point

¹ Take, for example, this one sentence of Zarathustra: "Und diess Geheimniss redete das Leben selber zu mir: 'Siehe, sprach es, *ich bin Das, was sich immer selber überwinden muss*'" (*Werke*, vi. 167). What can show us more clearly and concisely that Nietzsche's ideal was one which transcended life, which was, therefore, essentially supra-rational? As this is not the place here to go into the details of Nietzsche's philosophy, we can only refer the reader to some admirable pages of M. Emile Faguet, which resume the ideas of Nietzsche, in his book, *En Lisant Nietzsche*, especially pp. 321 ff. Paris, 1904.

they were seeking to avoid ; if the French Revolution, which turned the churches into banqueting halls and declared war to the knife against Christianity, was forced to invent a new religion, the so-called Religion of Virtue, to take its place ; if the modern State, having declared that it ignores all religion, is nevertheless forced to fall back on the religion of patriotism, and to substitute itself for the deity it has dethroned ; if a great intelligence like that of Auguste Comte is forced to end up by making a religion the basis of his Positivist system ; if every great philosopher who seeks to give a value to the ideal of life, is forced to go beyond life in order to find that value ; after all this, we may reasonably see in the *besoin de croire*, as Brunetière has called it, in the "need to believe," some justification for the view that *religion is a sociological necessity*.

There is, indeed, not a single example in history of a society existing for any length of time without religious belief ; and by religious belief we do not mean Christianity alone, but a spiritual organisation based on supra-rational principles. As Schaeffle has said : " We can recognise as a fact, proved by experience, that ideal love for the Good, the True, and the Beautiful ; that an altruistic belief in a Reality, in a Perfection, which is for us something primordial ; form part of the fundamental and indestructible characteristics of our mental nature. And this 'belief' is to be found, in some part or other of the mind, even in those who imagine that they believe nothing ; even as in another part we find that tendency to injustice and immorality which the former counterbalances."¹ And, in his classical work, Schaeffle has dwelt eloquently upon the part played by idealism in the life of society :

" It would be contrary to experience were we to look for the powerful social influence of idealism only in the religious or ecclesiastical activity of the social organism. The popular religion is certainly the foremost.

¹ A. Schaeffle, *Bau und Leben des sozialen Körpers*, ii. 393. Tübingen, 1896.

the most universal, the most concrete, the most coherent, and the most independent embodiment of religious idealism, and we therefore take it into consideration before all other phenomena. But religious idealism is not always thus incorporated, and, at any rate, it manifests itself as a social power even in circles which are professedly outside, not only the Church, but also every form of religion. And so strongly does it thus manifest itself that it is able to produce a great effect on political movements and on party organisation. Even in its non-religious and indeed non-ecclesiastical form idealism, or, rather, the sum of idealistic endeavours, constitutes a social force which continues to cause enthusiasm, to purify, to heal, and to sanctify, even when the religion of the Church is but an exterior appearance, and the Church itself corrupted. . . .

"The Christian spirit acts as a vital power, as an idealistic force, outside the ecclesiastical forms in which it is expressed, and must, therefore, still contribute to the ennobling of humanity, even should the various historical forms of the Christian community be doomed to destruction and disappearance. Even in its positively religious form, idealism does not manifest itself only as an ecclesiastical discipline; the 'invisible' Church must not be forgotten alongside of the visible one. Positive religion lives and works as a fertile and luminous force not only within the organised communities affiliated to religious belief—in the Church in the narrow sense of the word—but within every form of human organisation."¹

While fully admitting, with Schaeffle, that religious idealism manifests itself as a social power even in circles which are professedly outside every form of religion—as it did in Robespierre and the apostles of the "Religion of Virtue," and as it does in the modern movement which seeks to detach ethics from all connection with religion—nevertheless, if it is to manifest itself integrally, if it is to realise all the potentialities contained within it, religious idealism must assume a concrete form in the shape of a social institution. That form of religious idealism which is best integrated in a coherent organisation permeating society with its influence, will have the best chance of socialising the community. Indeed, we may say that religious idealism can only hope to be a social force in proportion as it is embodied in a coherent organisation; a vague religious idealism, possessed of no social organisation, and appealing only to the individual,

¹ A. Schaeffle, *Bau und Leben des sozialen Körpers*, ii. 394. Tübingen, 1896.

is not a social force ; it is essentially individualist ; and religion can hope to socialise the community only on condition that it liberates itself from individualism. In fact, it is the particular weakness of our actual social organisation that idealism has become more and more detached from that social organisation which alone can render it efficacious as a social power. In harmony with the prevailing tendency of our times, idealism has tended to become ever more individualist ; and thus the great factor of social stability and integration has been reduced to impotence by being detached from its natural basis.

We may go further ; and we may say that the loosening of the bonds of religious organisation—of that organisation in which, as Schaeffle says, idealism found its most concrete, its most universal, and its most coherent expression—has done more to destroy all idealism, and to substitute for it the excessive individualism from which we suffer to-day, than anything else. Let us turn once more to the phenomena of suicide. If Catholicism protects its adherents better against suicide than Protestantism does, it can only be because Catholicism is more integrated than Protestantism ; because Catholicism possesses, by virtue of this integration, a greater hold and influence over the individual than Protestantism. And, indeed, the principles on which Protestantism is founded are such as to render disintegration of the religious organisation easier ; it is a matter of common observation that Protestantism does not constitute such a compact and strongly coherent system as Catholicism. As we have several times quoted Auguste Comte, we may quote him again in this connection :

“ It is important,” wrote Comte, “ that we should have a clear notion of those characteristic perversions, at first intellectual, and subsequently moral, which . . . have invariably their real source in that dangerous spiritual principle consecrated by Protestantism, according to which speculative liberty is proclaimed for all without anyone being able to establish firmly the rules capable of governing the usage of this liberty.”¹

¹ *Cours de Philosophie positive*, v. 539, 540.

Here, indeed, we have the fertile source of all those errors into which idealism, dissociated from the organisation which is its natural expression, may lead us. The individual is taught that liberty of speculation as to the sources of his idealist tendencies is desirable ; and, as a consequence of this, liberty of speculation as to the form and direction which those tendencies ought to take is not only allowed, but strongly urged. The result is that the individual, free to choose his path, and compelled to rely solely on his own judgment, becomes lost in a maze of speculations ; he becomes more and more desocialised ; and his very idealism does but serve to accentuate his individualism, to aggravate his lack of solidarity with the rest of society. Idealism is no longer associated with all-powerful and venerable traditions ; it is no longer the link which unites the individual, not only to the rest of society in the present, but to the past and to the future ; it no longer envelops every moment of the individual's life, or gives to it that value which it gives when it means a continuance of great traditions, and when it is a perpetual symbol of the responsibility of the individual to society in the past, present, and future. Idealism, under such conditions, passes from the concrete to the abstract ; and in so doing, it passes also from the coherent to the incoherent. The individual is no longer incorporated, through its agency, in a living whole which confers a value on him, and in the presence of which he feels himself inspired by a sense of responsibility. It becomes, on the contrary, a living reminder of his isolation ; he finds himself confronted by contradictory principles ; and the principle to which he adheres has no sanction beyond that of his own judgment. Thus the idealistic principle, once we embark on the path of individual speculation as to its origin and direction, becomes essentially rationalistic—that is to say, we deprive it of its very idealism by depriving it of its supra-rational sanction.

But if idealism have a supra-rational sanction, then it must not be individualist ; it must be a social principle ; and to be a

social principle it must necessarily be incarnated in a social organisation which is strongly integrated, strongly coherent, capable of permeating society with its influence. The vague idealism which is based on individual judgment is not a social principle ; it is a rational principle, which can have no power to effect social cohesion. And the only organisation which answers to these conditions ; the only organisation in which there has not been proclaimed a speculative liberty, the basis of which it is impossible to establish ; the only organisation which responds in a sufficient measure to the conditions of universality and stability and integration ; the only organisation which is capable, by means of its great traditions, of linking the individual with society in the past, the present, and the future ; the only organisation which is able, by means of its conditions of universality, stability, and integration, to confer adequate value on the life of the individual, and adequate sanction on his acts—in a word, the only organisation *capable of constituting a spiritual organisation of idealistic and supra-rational principles adequate to the needs of Western civilisation*—is the Catholic Church. Thus, from the sociological point of view, the Catholic Church must be considered as a factor of fundamental importance.

Having arrived at this conclusion, we must, at the risk of appearing to repeat ourselves, go back to the conclusion arrived at in the last chapter : the conclusion, namely, that science, while it constitutes one of the noblest expressions of the expansion of the human intellect, is incapable, nevertheless, of completely satisfying the need for expansion. Science, while it stimulates the need for expansion, brings us at every turn to a frontier which we are unable to cross ; and the Unknowable stands as a perpetual barrier which checks all further effort, and contemplates, as if in irony, our vain endeavours to break it down. But, if nothing is more capable than science of showing us what are the limits of the human intellect, and how puny

is the smallness of that intellect in comparison with that which transcends human intelligence ; nevertheless nothing is better adapted to stimulating our exertions, nor better calculated to develop our desire for expansion, than science ; so that, in the sphere of human evolution, it has an invaluable and indispensable part to play. What we have said, however, as to the limits of science—limits which are an inevitable consequence of its relative nature—and as to the primary necessity for the social organisation of a spiritual foundation of idealistic and supra-rational principles, shows us that science must needs be completed by some other factor, which, by fulfilling needs which science has accentuated, but which it is incapable of satisfying, shall be the indispensable final aim, as it is also the indispensable basis, of social evolution. In other words, the harmonious co-operation of supra-rational speculation and scientific induction is a necessity for the social organism. Science and religion are both equally essential to the expansion of life ; for while science tends to increase the sphere of conflict, and to develop the intensity of human effort, religion gives an adequate sanction to this conflict and *Streben*.

The fullest expansion of life can thus only be reached by means of the harmonious co-operation of science and religion, or, rather, by means of the *completion* of scientific knowledge by religious belief. The frontiers to which science lead us at every turn are frontiers which mark off a domain that transcends the human intellect, and into the mysteries of which human knowledge can obtain no insight. But, none the less does the human intellect chafe and fret at these limits which are thus imposed on it ; and, in order to relieve the suffering which this check to expansion entails, one factor alone retains its potency ; and that factor is faith. Where knowledge cannot penetrate, faith can penetrate ; and it is faith which is the motive of hope.

Religious belief corresponds to the necessities of the emotional nature, even as science corresponds to the necessities of the

intellect. It is an error to regard the intellect as the primary element of human life ; it is an error to consider the human reason as an all-powerful factor, capable by virtue of its inherent potentialities of satisfying all our desire for expansion. Have rationalists, then, forgotten that Immanuel Kant has lived, and that he has shown us conclusively that the ideas of God, of Liberty, of Immortality, are beyond the domain of Pure Reason ? They are beyond this domain ; but the fact that they are so will not cause humanity to cease interesting itself in these questions. The intellectual nature of man finds adequate satisfaction in science ; the emotional nature of man can find such satisfaction only in religious belief. And why should we seek to deny the right of the emotional nature to satisfaction ? Does not the emotional nature constitute that which is fundamental in our life, that which is at the basis of our *Streben* ? The demand of the emotional nature for satisfaction is but a demand for the expansion of life itself. The man who is all intellect is a man who is, as it were, afflicted with hemiplegia. He has deliberately cut himself adrift from the source of that which is deepest and most beautiful and most incomprehensible in life. It is the emotional nature which is the source of genius. Does anyone suppose that those works which most greatly move humanity, and which will not perish while humanity endures—a picture of Raphael, the statue of the Apollo Belvedere, the Last Judgment of Michelangelo, the *Hamlet* of Shakespeare, the *Faust* of Goethe, the *Zarathustra* of Nietzsche—does anyone suppose that these are the works of intellect, of that which is most superficial in man ? Are they not rather works inspired by the greatest tension of the soul, expressions of the overflowing of the riches of the soul, concealing within themselves the treasures “which jewel and gold could not equal, neither should it be valued with pure gold ?” As Emerson has said :

“ Though we travel the world over to find the beautiful, we must carry it with us, or we find it not. The best of beauty is a finer charm than

skill in surfaces, in outlines, or rules of art can ever teach—namely, a radiation from the work of art of human character—a wonderful expression through stone, or canvas, or musical sound, of the deepest and simplest attributes of our nature, and therefore most intelligible at last to those souls which have these attributes. In the sculptures of the Greeks, in the masonry of the Romans, and in the pictures of the Tuscan and Venetian masters, the highest charm is the universal language they speak. A confession of moral nature, of purity, love, and hope breathes from them all.”¹

Or what can be more beautiful than Goethe’s definition of genius?—

“Alles, was wir Erfinden, Entdecken im höheren Sinne nennen, ist die bedeutende Ausübung, Betätigung eines originalen Wahrheitsgefühles, das, im stillen längst ausgebildet, unversehens mit Blitzesschnelle zu einer fruchtbaren Erkenntnis führt. Es ist eine aus dem Innern am Äussern sich entwickelnde Offenbarung, die den Menschen seine Gottähnlichkeit vorahnen lässt. Es ist eine Synthese von Welt und Geist, welche von der ewigen Harmonie des Daseins die seligste Versicherung giebt.”²

And it was Goethe who made the profound remark that “man must hold fast to the belief that the incomprehensible is comprehensible; for otherwise he would make no inquiry.”³ But if this condition is to be fulfilled, is not belief an essential requisite to its fulfilment? For what can make the scientifically incomprehensible comprehensible to us, if not belief?

It is a curious fact that Rationalism, while it proclaims freedom of inquiry, and the necessity for the intellect to be unrestricted in its expansion; nevertheless would deny to that which is more fundamental than the intellect the satisfaction which alone can be adequate to it. But if we grant to the intellectual nature of man the right to expand, and to seek in scientific research the satisfaction to which it is entitled; surely we must grant likewise to the emotional nature of man the right to expand, and to

¹ Emerson, *Essays*, p. 204. World’s Classics Edition, 1902.

² *Werke*, xviii. 194. Edition Max Hesse, Leipzig.

³ “Der Mensch muss bei dem Glauben verharren, dass das Unbegreiflich begreiflich sei; er würde sonst nicht forschen.”

seek satisfaction in religious belief. For that scientific knowledge which is adequate to the demands of the intellect cannot satisfy in a like manner the demands of the emotional nature; and in asserting the rights of the intellect *at the expense of the rights* of the emotional nature, as Rationalism does, we are arbitrarily limiting the expansion of human life; for we are seeking to nourish the emotional nature of man with food unsuited to its wants, thus leaving its hunger unsatisfied. And as every desire which is unsatisfied implies a state of positive suffering, we are condemning humanity to remain in a condition of suffering, produced by the non-satisfaction of its emotional wants. We forget that science corresponds to the intellectual nature of man; but when this intellectual nature has been satisfied, there remain the vast and unfathomed depths of the emotional nature, of the "inner life," with its hopes and fears, and joys and sufferings, and passions and aspirations. And in order to complete the expansion of life, we must gratify the desire for expansion of the "inner life," even as we have gratified that of the intellect. Those scientific constructions of the intellect, which respond to the need for intellectual expansion, must be superimposed on that religious belief which corresponds to the need for emotional expansion.¹

¹ In connection with what we have said concerning the *role* of the emotional nature in life, we may recall the eloquent things which Schopenhauer has written concerning the "intimate essence of art," and the "metaphysics of music." "Everything which is produced spontaneously," wrote Schopenhauer, "for instance—the sketch traced as if unconsciously by the poet in the fire of the first conception; the melody suggested to us solely by inspiration, without the aid of reflection; finally, lyrical poetry properly so called, the simple song, in which the actual disposition of the mind, profoundly felt, and the impression of the present surroundings, are made manifest in verses of which the rhythm and the rhyme come about of themselves—all these productions, I say, have the great advantage of being the pure work of the enthusiasm of the moment, of the inspiration and unfettered stimulus of genius, without any mixture either of reflection or intention. This is the reason of their delicious flavour of ripe fruit; this is the reason why their effect is infinitely greater than that of

Having thus justified the persistence of supra-rational belief as an essential part of the desire for vital expansion—for such belief responds to the need of expansion of our emotional nature—let us return to the question of the social organisation of these supra-rational principles by a spiritual body capable of permeating society with its influence, of knitting together the individuals which compose society, and of giving an adequate sanction to those conditions of conflict so indispensable to progress—conditions which are caused by the inherent tendency of all life to expand to the utmost limits allowed it by its constitution. If the necessity for supra-rational principles is recognised, it follows that these principles must be incarnated in a spiritual organisation capable of giving effect to them. For supra-rational principles are, by definition, principles which transcend the limits of individual reason; and the individual cannot by himself organise these principles in such a way as to render them adequate to their ultimate function of social integration. For the individual, supra-rational belief is the means by which the expansion of the emotional nature is effected. But it is obvious that this is not the only function of such belief. In proportion as the desires of the emotional nature in the individual are gratified, the conflict which arises from the expansion of the various individuals composing society must also be justified by an adequate sanction. So that we may say that supra-rational belief possesses both social and individual value; in other words, *that such belief is a sociological as well as an individual necessity.*

Society cannot be disintegrated without a simultaneous loosening of the bonds which unite the individuals composing it; and, conversely, the disintegration of the social organism cannot take place if there be a set of coherent and vivifying

the works of art which are the most studied, the most perfect, the most slowly executed" (*Le Monde comme Volonté et comme Représentation*, vol. iii., p. 219. French translation by Burdeau, Paris, 1903).

principles, which confer a sanction on the conditions in which individual life is lived.¹ If there be no such set of principles; if the individual, detached from all principles which confer a higher value on life, be thrown on his own resources; obviously his life will be deprived of its value; and society, by this very fact of the reduction of the value of individual life, will have its integration correspondingly impaired. For society can be integrated only in proportion as the individual life possesses value; and, conversely, individual life can possess value only if it has a sanction which transcends not only the individual but society. If individual life is to possess an adequate sanction, then it must derive its sanction from a social principle; or, rather, from a social principle which rests, in its turn, upon a suprasocial basis. The expansion of the emotional nature of man cannot receive sufficient satisfaction from an idealistic principle which remains individualistic in its nature. But it is precisely this fact—i.e., that supra-rational or idealistic

¹ Professor Marshall has laid especial stress on the importance of industrial life as a factor of social organisation and social stability. "The quick decadence of Greece . . . was brought about by the want of that solid earnestness of purpose which no race has ever maintained for many generations without the discipline of steady industry. Socially and intellectually they were free, but they had not learnt to use their freedom well; they had no self-mastery, no steady persistent resolution. They had all the quickness of perception and readiness for new suggestions which are elements of business enterprise, but they had not its fixity of purpose and patient endurance. The genial climate gradually relaxed their physical energies; they were without that safeguard to strength of character which comes from resolute and steadfast persistence in hard work, and they sank into frivolity" (*Principles of Economics*, p. 19). The economist, as Professor Marshall has pointed out, must also take account of ethical forces; and, indeed, it appears to us strangely erroneous to consider economic science as having no concern with moral problems, and as being solely occupied with the material wealth of man. The very foundations of industrial life are ethical in their nature; for if it be true that the discipline of steady industry is a moral factor of great importance, such discipline can itself be acquired only by a race whose moral fibre is excellent. It is only on the basis of social integration ensured by a supra-rational organisation that the industrial structure can be established.

principles can confer an adequate sanction on individual life only if they are incarnated in an organisation which embraces the whole of society in its sphere of action—that supplies the *sociological* justification of principles which are primarily justified by the satisfaction they afford to individual wants. The *primary* function of religious belief is the satisfaction of the desires of the emotional nature of the individual; the *ultimate* function of such belief is the integration of the social organism; for only in a society thus integrated can the primary function of religious belief be adequately fulfilled.

But what are to be the attributes of this spiritual organisation so essential to social life? Is it to be an organisation independent of the civil power or subordinate to it? We may again quote Schaeffle's definition of the limitations of the power of the Church:

“In the family, in the economic and social activity of society, in science, in art, in the State, everywhere where the human genius is at work, it is incumbent on the Church to give a religious impress and a religious sanction to the feelings, the desires, and the whole spiritual life of society. All this lies within the sphere of the duties of every Christian Church. . . . But, beyond this, the Church is as little competent as it is authorised to interfere in secular matters in the manner employed by the secular powers. Her mission is not to serve the State, or to take the sword into her hands.”¹

It may be objected that the claims which the Catholic Church puts forth are far more ambitious; and the Syllabus published by command of Pius IX. may be brought forward in support of this assertion. The Syllabus, as is well known, is the list of a number of doctrines which are condemned as heresy by the Apostolic See, and which Catholics are forbidden to hold. The condemnation of the proposition (No. XIX. on the list of the Syllabus) which declares that “it is the office of the civil power to define what are the Church's rights and the limits within

¹ A. Schaeffle, *Bau und Leben des sozialen Körpers*, ii. 395. Tübingen, 1896.

which she may exercise them," has been construed into meaning that the Church claims to be completely independent of the civil power. This, however, is by no means the case. The Church claims the right to an independent existence within her own sphere; and the control of the Church by the State implies clearly a negation of the fundamental principles on which the Church is based—namely, that the Church is an organisation *sui generis*, living her own life, possessing her own inalienable rights. But though the Church most justly claims freedom from State control or State interference, this does not imply that she claims at the same time any domination over the State. The sphere of the civil power is a sphere *sui generis*, just as the sphere of the spiritual power is a sphere *sui generis*. With the dogmas of the Church, with the rights of the Church to give to her children the education she deems proper for them, the State has nothing to do; the rights of the Church, and the limits within which she may exercise them are, in the sphere of the spiritual organisation, things which can be subject only to the rules of the Church. Here, again, we may cite Auguste Comte as a witness in favour of the autonomy of the Church in everything which concerns the spiritual life and spiritual organisation:

"The spiritual power being essentially concerned with *education* and the temporal power with *action*, taking these terms in their entire social acceptation, the influence of each of these powers must, in every system in which they are really separated, be supreme in its respective sphere; and the *rôle* of each as regards the special mission of the other must be a purely consultative one, in conformity with the natural co-ordination of the corresponding functions. . . . All the spiritual attributions being thus judiciously systematised, thanks to the unique principle of education . . . the reader is easily able to recognise that, far from our being able to accuse the Catholic Church of any serious usurpations on the authority of the temporal power, the former has, on the contrary, been, as a rule unable to obtain anything like the full measure of freedom which is indispensable for the accomplishment of the daily duties of her noble office, even during the epoch of her greatest political splendour, from the middle of the eleventh up to the end of the thirteenth century."¹

¹ *Cours de Philosophie positive*, v. 265 ff.

The example of France is a case in point. The Law of Separation, passed by Parliament in December, 1905, provides that the churches and buildings belonging to them shall, within the space of one year from the promulgation of the law, be placed in the hands of *associations cultuelles*, or associations for public worship, of which the Bishop in every diocese is to be the head ; but the Law of Separation further provides that the financial affairs of these *associations cultuelles* shall be under the control of the State. Thus the State, although it has declared that henceforth it ignores the Church, claims the right to retain the control of the finances of the Church. This is a flagrant violation of the rights of the Church. The State no more possesses the right to control the finances of the Church than the Church possesses the right to control those of the State. This provision of the French Law of Separation constitutes a case of State interference which nothing can justify, in the affairs of the spiritual organisation ; and this latter claims the common right to be the master in its own house.¹

France, however, furnishes more than this one example of unjustifiable State interference in the sphere of the spiritual organisation. The Law of Association, passed in 1901, at the instigation of Waldeck-Rousseau, already constituted a serious violation of the liberty of the Church, to say nothing of the violation of personal liberty further implied by it. The right of the Church to constitute religious orders—in other words, to organise herself as seems best to her—is, we say, incontestable. And, indeed, only political animosity and anti-clerical fanaticism can possibly justify this placing outside the law of thousands of men and women for the sole offence of living together, bound

¹ It is regrettable that the most authoritative newspaper in Great Britain, the *Times*, should have been systematically furnished by its correspondent in Paris with unfair and misleading reports concerning the real object and purport of the French Separation Law. The latter, far from being the law of liberty which one could have wished, being in reality a law inspired by sectarianism and hatred of Christianity.

by certain rules, and wearing a peculiar garb.¹ The suppression of the teaching orders in 1904, under the provision of the *loi sur la suppression de l'enseignement congréganiste*, was a further violation of the elementary right of the Church to organise for her children that mode of teaching which she deems indispensable for them.

The ideal for the Church is certainly to be found in the formula of Cavour, *l'Église libre dans l'État libre*. One article suffices for the establishment of this system: the Church ignores the State, the State ignores the Church. Leave to the Church the spiritual organisation of society, and the liberty of pursuing that aim as she thinks best; and, similarly, the State must be left entirely free to organise the material welfare of the nation. This ideal is not a chimera; this mutual separation of the two spheres prevails in the United States, as it prevails also in Belgium. The Church demands no privilege; it demands only liberty and the rights of the common law; and the proof that liberty does not slay the Church is seen by her progress in the United States, in England, in Belgium, in Germany, in every country where she is placed on equal terms with other organisations, and where the State abstains from interference.

"Even if our mental constitution," wrote Auguste Comte—and one can rarely tire of citing Comte in these days when Positivism is often

¹ We have no space here to discuss the question of the social value of the religious orders. We must, however, be careful to distinguish between their social value during the Middle Ages and their social value to-day. Celibacy, by eliminating persons whose egoistic instincts are developed at the expense of their social instincts, must be considered as a factor of importance in social selection, and obviously a considerable number of socially unfit elements are attracted by the religious orders and eliminated. We must consider the men who shrink from fulfilling their primary social duties as socially unfit, and it is to the interest of society that such persons should be eliminated. It is, of course, evident that a man can pay his debt to society in other ways than by founding a family—for instance, by enriching its intellectual patrimony. Thus, the Society of Jesus has amply discharged its social duties by its indefatigable intellectual activity.

held up as antagonistic to religious belief—"permitted the preponderance of our best instincts, the habitual ascendancy of these would not establish any real active unity without an objective basis which the intellect alone is capable of furnishing. *When the belief in an external power is incomplete or uncertain, the purest sentiments will never prevent strange perversions and profound dissonances from setting in.* What would be the case, then, if one were to suppose human existence to be entirely independent of any exterior power? . . . Before all things, therefore, religion must aim at subordinating us to an external power, the irresistible supremacy of which shall leave no room for any uncertainty. . . . At the beginning of the century this intimate dependence of humanity on an external power was still ignored by the most eminent thinkers. *The gradual appreciation of this truth constitutes the chief scientific acquisition of our time.*"¹

We find, in this passage from Auguste Comte, ample confirmation of our argument that idealism, if it is to be effective, must be embodied in a social principle. The idealism which is termed individualist idealism is deprived, by the very fact of its individualism, of all its potency. There is, in such idealism, an entire lack of faith in a principle external to the individual, and superior to him; and when we remove idealism from its sociological basis, when we seek to individualise it, we are sowing the germs of that profound discord which individualism can never fail to produce, and which, in itself, suffices to render the principle ineffective. The individual life, left to itself, thrown on its own resources, is a life the value of which is reduced to the proportions of the individual himself—a mere passing speck of dust in the infinity of time. In order to confer an adequate sanction on individual life and its sufferings, that sanction must come from a principle which is external to the individual; it must come from a principle which is more lasting than the individual; it must come from a principle which is in itself possessed of adequate sanction. But what principle can claim to be possessed of a sanction sufficient for this purpose, if that sanction is one which

¹ A. Comte, *Système de Politique Positive*, vol. ii., pp. 12, 13. Our quotation is from the text given in the highly interesting and valuable work of F. Brunetière, *Sur les Chemins de la Croyance : l'Utilisation du Positivisme*, p. 286. Paris, second edition, 1905.

is recognised by an infinitesimal minority of persons, and if it be not vigorous enough to permeate all society with its influence, to mould society as if it were wax ? Consequently the sanction adequate to individual life must be a sociological sanction. But what does this mean, if not that the individual, if sufficient value is to be conferred on his existence, must belong to a strongly integrated society, a society integrated by the recognition of a common sanction, with regard to which there is no dissension, which derives its value from the fact that it is a sanction *quod semper, quod ubique, quod omnibus* ?

Therefore the value of individual life is dependent on the integration of that society to which the individual belongs ; and the integration of society depends upon the common recognition of an adequate sanction for existence. Thus, if the sanction adequate to individual life is necessarily a sociological sanction ; this sociological sanction, in its turn, can be effective only on condition that it transcend society, that it be external to society, that it constitute a prolongation in time and space of the life of society, that it be, in a word, suprasocial. For, even as the individual must derive his value from a principle which is external and superior to him ; so also must society derive those principles of integration and cohesion which alone can give it stability, from sanctions which are not inherent, but external and superior to itself. For, although a social aggregate does undoubtedly possess laws *sui generis* which govern its evolution, nevertheless, it is always, if it be analysed to its ultimate elements, a collection of individuals ; and, if the sanction which was destined to ensure the integration and stability of society were restricted to the potentialities of human society, which are, in turn, very limited in time and space ; this sanction would not possess the requisite value. As we have already said, the fundamental question of sociology, namely, the inequality between men, could find no sanction in the affirmation that those who suffer from this inequality are thereby benefiting society ; the

inequality of men, and the division of labour, which is its natural consequence, require a sanction which is not inherent in society, but which transcends and surpasses it.

Approaching the matter from the converse point of view, we arrive at a similar result; if the primary law of life be that of expansion, the sanction which confers the greatest value on individual life must be one which is in harmony with this law. And it is precisely by means of religious belief that the full measure of human expansion can be realised; for, if we take away from humanity the beliefs which respond to the needs of the emotional nature, we restrict thereby the expansion of that nature, and we reduce correspondingly the value of life. But the belief, or supra-rational principle, as we have termed it, which alone can afford adequate satisfaction to the needs of the emotional nature, must be a *social* belief; for if we take away from the supra-rational principle its basis of universality, and limit it to the individual, we take away at the same time its whole supra-rational foundation. Detached from its natural basis, idealism is merely rationalism; a supra-rational ideal, which is to satisfy the needs of the emotional nature, must necessarily be beyond the individual, and it must necessarily transcend the limits of the individual. Thus, whether we consider the needs of the individual or the needs of society, the necessity of religion as a sociological factor appears clear to us.

But if every religion, by the very fact of its being based on supra-rational principles; by the very fact of its appealing to an ideal which is superior to individual reason; by the very fact that it assumes as *conditio sine qua non* a sanction which implies a prolongation of individual life, which appeals from the individual to the *whole*, which is superior to the individual; if, we repeat, every religion is thus based on universality—as distinct from individuality—as an essential condition; what does this mean? Does it not clearly mean that *every religion is by its*

definition a social phenomenon? Does it not mean that religion can never be based on individual judgment and individual reason alone, but that it implies a sanction for the individual derived from a principle which is higher than the individual? And, conversely, if society can be assured of stability only on condition that it be strongly integrated by common recognition of a sanction which must be, as nearly as possible a sanction *quod semper, quod ubique, quod omnibus*; if this sanction must necessarily be a suprasocial sanction, not inherent in, but external to, society; if, in other words, the stability and cohesion of a society depend on the strength of its religious beliefs; may we not, therefore, say that every social collectivity is also a religious collectivity? And let us not be led into error by sociologists who tell us that religion is a bygone superstition, and that we must set about finding a new code of social morality. What is this new code of social morality, if not an essentially supra-rational and suprasocial principle, the object of which is to integrate society by giving to social life a sanction possessing the essential requisite of universality? If morality is postulated as a principle of social integration, then it is postulated as a principle which is higher than society, external to society, suprasocial as it is also supra-rational. That is to say, that it is a religion—a new religion, perhaps, but a religion none the less. For morality can never be detached from supra-rationalism. Rationalist morality, if it be logical, tells us that we must eat and drink, for to-morrow we die; it must be limited to the individual; it must give to the individual as supreme object during the short space of existence the attainment of the maximum of personal pleasure. It is in hedonism, or in the doctrine of Max Stirner, that we find the logical consequences of Rationalism applied to morality; and perhaps, as Eduard von Hartmann suggests, it is because Max Stirner is so ferociously logical that he is so conveniently ignored by many. But when morality intervenes, when we appeal to a principle which is

superior to the individual, we appeal to a supra-rational principle, to one which claims precisely to be superior to the individual reason.

This conception of the social organisation as a religious organisation we find nowhere better expressed than by M. de Roberty in a recent work. That eminent sociologist is precisely one of those who see in religion a superstition of bygone ages ; and it is therefore gratifying to find him so expressly associating sociology and morality. M. de Roberty's definition of sociology is as follows :

" A transmutation *sui generis* of the *organic multiplicity* (species, race) in a higher or *superorganic unity* (community, city), accompanied by the metamorphosis of the *organic unity* (egoism, isolation, parasitical symbiosis) in a *superorganic multiplicity* (altruism, co-operation, solidarity). This definition, I need hardly say, aims at nothing less than at making what is called the 'moral sense,' or morality the basis and the starting-point of all sociology. The latter would be thus closely assimilated to ethics."¹

One of the chapters in this same book of M. de Roberty is entitled *La Déchéance des Religions*. And yet let us read what M. de Roberty has to say concerning one of the highest and purest forms of supra-rational symbolism—concerning love, than which nothing is less rationalist, because nothing more markedly transcends the limits of the individual, because nothing is more essentially a completion of the concept of individuality, because nothing is so little based on reason. Love is, like faith, the outpouring of the deepest fountains of the emotional nature of man. It has been said—by Max Stirner amongst others—that love is but a form of egoism ; that our love for another is but the ardent wish to gratify our own desires ; that our love for a woman is but a desire to possess the object of our love ; that in other words, love does but serve to mask the passions of self-gratification and of self-flattery ; that we are flattered when our love breaks down the barriers opposed to it ; and that love

¹ E. de Roberty, *Nouveau Programme de Sociologie : Esquisse d'une Introduction générale à l'Étude des Sciences du Monde Surorganique*, p. 14. Paris, Alcan, 1904.

does but hide a desire of power, of exercising our power over another. That this is often the case, may be true; but, if it is, we are not dealing so much with love as with other sentiments, equally emotional in their nature but less artistic. But can we say of the purest forms of love which genius has symbolised that there is nothing but egoism in them? Was there only egoism concealed in the pure love of Gretchen for Faust? or in the love of Elizabeth for Tannhäuser? or in the love of Tristan and Isolde? In his beautiful work on the art of Richard Wagner, Alfred Ernst remarks concerning the scene in "Tannhäuser" in which Elizabeth prays for the sinner, and obtains for him and for the whole world pardon and redemption: "This truly sacred scene . . . will remain ideally chaste, infinitely human and sad, admirably significant alike by reason of the drama which it dominates and by reason of its own grandeur. Those who have suffered, who have learned to know what abandonment and mourning mean, but who have believed without despairing and who have loved without failing, will listen passionately to the invocation of immortal love, to the prayer of Elizabeth."¹ No, there is something more than mere egoism in this purest of all forms of art. And M. de Roberty has understood this, and written some admirable pages on the subject. He remarks very truly:

"A last æsthetic quality, and not the least, distinguishes true love. As every one is aware, the latter is the auxiliary and the most energetic stimulant of action. In this respect love yields nothing to faith, which, we are told, removes mountains; and the wonders which love has accomplished, and which have long since become celebrated, are not to be counted. Well, if all this is not art, and the best, the most glorious, the most fundamental, the purest art, I would like to know what merits the name of art."²

¹ Alfred Ernst, *L'Art de Richard Wagner: L'Œuvre Poétique*, p. 376 (Paris, Librairie Plon, 1893). It must always remain a subject for poignant regret that Alfred Ernst, one of the most profound disciples of the great master, was so prematurely removed by death, without being able to complete his work.

² E. de Roberty, *Nouveau Programme*, p. 123.

M. de Roberty is perfectly right in asserting that these things are not foreign to sociology. And if love play so great a rôle in sociology ; if it be capable of moving mountains, and of transforming the destinies of humanity for thousands of years ; what does this mean, if not that idealism is the great secret of the history of nations ? For what can constitute a higher form of idealism than love ? And even if, as M. de Roberty asserts, the religions are worn-out superstitions, nevertheless, on his own admission, it is the torch of idealism, the torch of supra-rationalism, which must light the path of human evolution in the future as it has lighted it in the past. It is on *faith* that M. de Roberty falls back, on the faith which he declares to be the most energetic stimulus of action ; for love is faith, it constitutes one of the purest and most exalted forms of faith, and it is because it is a faith that it has worked those wonders to which M. de Roberty pays eloquent tribute.

Thus, here again, we find one of the most eminent of sociologists, one who has been most associated with the progress of sociological science, falling back on a supra-rational sanction as the essential requisite of social integration. And if a supra-rational sanction be indeed a condition *sine qua non* of social integration, and therefore of social stability, we may conclude that *every stable and integrated society is, by reason of its stability and integration, at the same time a religious organisation*. For a supra-rational sanction is a religious sanction ; it is a sanction which is not limited to the individual reason alone ; it is a sanction which, transcending the individual, aspires to universality ; and which, to be effective enough to secure adequate social integration, must be an universal or quasi-universal sanction.

But what sanction possesses this necessary degree of universality if not the religious sanction ? Deprive morality, as Eduard von Hartmann has said, of its metaphysical basis, and we deprive it of that imperative character which all morality, if

it is to be effective, must possess. Morality implies religious belief; we have been led to reject the view which sees in the fact of social life a sufficient foundation for social morality. Transcending society itself, morality must be founded on a principle which is suprasocial; and if we admit that morality derives its sanction from a principle which is external to society, and which dominates it, we enter into the sphere of metaphysical and religious belief.

Thus we may say, in conclusion, that, alike from the purely individual point of view of the expansion of the emotional nature, and from the larger sociological point of view of social integration and stability, religion is a necessary factor in human life. In truth, these two points of view are in reality one. Religious belief is a sociological necessity; and, to fulfil its indispensable social functions, this belief must be incarnated in an organisation which is truly social in its nature. The stability of the social structure is dependent on the security of its spiritual foundation.

NOTE.

We would like to take this opportunity of replying to two criticisms which Mr. Benjamin Kidd has made with regard, firstly, to our discussion of the principles of Liberal polity, and, secondly, to our remarks on the evolution of modern Japan.

Mr. Kidd has objected that we are certainly wrong in attributing the Liberal principles of non-intervention and *laissez-faire* to Kant and the German idea of the *Rechtsstaat*; for these principles descend historically from the period of the English Commonwealth. If we have, indeed, conveyed the impression that the doctrine of *laissez-faire* is derived from Kant, then we must apologise for our clumsy phraseology. Such was certainly not our intention. We did not mean to attribute to Kant the paternity of an idea essentially English alike in its origin and development, nor did we mean to imply that there is any direct relationship between the school of Adam Smith and the school of Kant. We sought to discover the main principles of Liberal polity, and we found these principles to be similar in Germany and in England. We selected Kant as the authorised exponent of Liberalism, because Kant with his theory of the *Rechtsstaat* certainly laid the foundation of philosophic, as distinct from economic, Liberalism. But, from another point of view, the economic

school of Liberalism reached the same conclusions. Kant laid more stress on the ethical element of solidarity, the economists on the economic and non-ethical element of competition. But the ethical ideal of Adam Smith, Ricardo, and J. S. Mill was similar in all respects to that of Kant. The only difference would appear to have lain in the fact that Kant and Fichte, less optimistic than the economists, recognised the necessity of *Rechtsgesetzen* to protect the weaker party in the conflict; while the economists were convinced of the identity of individual and social welfare. In other words, our aim was to expound the principles on which Liberalism is based, not to trace their genealogy. In order to show what these principles are, we quoted, on the one hand, Kant and Fichte, on the other hand Adam Smith, Ricardo, J. S. Mill, and other economists of the Manchester schools. Because the ethical principles of both schools are the same, it does not follow that one is descended from the other. And, indeed, the object of Kant's *Rechtsgesetzen* and of the Manchesterian doctrine of *laissez-faire* was identical—i.e., the liberation of the individual from the tyranny of the State.

Mr. Kidd has further complained that "we are following the catch-penny mood of the hour about Japanese development," and he has pointed out that it is a phase of Western development, and that there would have been no modern Japan without the West. We entirely agree with Mr. Kidd on this latter point, and we are unable to see that we have ever maintained a contrary opinion. It is evident that Japanese civilisation to-day, in its external aspects, is based on the civilisation of the West. The copy of the Western model has always been the avowed object of the Japanese. To suppose that a country riveted to the traditions of 2,500 years would be able spontaneously to change the whole façade of its national life in the space of thirty years, without assistance from without, would be to suppose a miracle; and miracles make too great a demand on the credulity of the scientist. But we should distinguish between the external and internal aspects of Japanese civilisation. Mr. Kidd lays undue stress on those aspects which are external. Underlying the expansion of industry, commerce, naval and military force, which gives so typically European an aspect to modern Japan, there is the vast reserve of three thousand years' traditions. "Bushido" and the spirit it has infused into the entire Japanese nation have not been modelled on the pattern of Western ideals. Japan adapted itself to the necessities of the situation created by the quickening of the means of transport; it set itself to imitate the Western model, because otherwise the West would have annihilated Japan, which does not possess, in its size and geographical situation, the *force d'inertie* which China is capable of opposing to Western aggression. But such imitation is external, and the adaptation of Japan, the *Europeanisation* of Japan, was rendered possible by the integration and cohesion which the Japanese nation derive from a spiritual organisation which is not European, but Oriental.

CHAPTER V

GENERAL CONCLUSION

THE keynote of this book is that selection is uninterruptedly active in eliminating all the waste products of organic activity, and that without this unceasing intervention of selection life must inevitably regress. Once this central fact is grasped, the importance of the action of selection in social life will be appreciated. But selection itself does but operate in order to secure, for all organic life, an ever more harmonious adaptation to environing conditions. Adaptation to the environment would appear to be the fundamental law of Nature; and selection would appear to be the means of obtaining this adaptation.

Thus the "aim" of Nature—in so far as we are justified in ascribing an aim to her—is not a moral but a mechanical one. Adaptation to the environment is obtained by merciless methods, by the ruthless extermination of unfavourable variations, by the wholesale destruction of the weak and the ill-adapted. The "aim" of evolution is not even the production of physically stronger or more beautiful organisms. There is a great deal in Nature that is beautiful; but there is much also that is the reverse. Along with the evolution of more greatly differentiated forms of life, the less differentiated have remained. The evolution of the Gibbon and Man has not caused the extinction of the Amœba; and how much is there in the organic world which seems to us useless—nay, positively repugnant? But these apparently useless forms of life persist; and the only reason we

can assign to their persistence is that they are adapted to their environment.

When we consider the world of organisms in its entirety, we are in a position to judge of the value of the claim of man to be the goal of evolution, the *raison d'être* of creation. And, viewed in this light, such a claim cannot but appear wholly irrational. As well might we say that any other of the numerous species of living beings is the *raison d'être* of creation. The persistence of the bacillus, the oyster, or the spider is not less extraordinary than that of man. Rather it is more extraordinary; for man's intelligence has rendered him formidable; whereas the bacillus, the oyster, and the spider are wholly defenceless and entirely at the mercy of their foes.

The truth is that man, like the oyster, is simply a product of his environment, adapted to his environment. Evolution has not been directed by a mysterious vital force in view of a "final" aim higher than Nature; but it can be understood solely by reference to environing conditions. The ever greater differentiation of living forms is but a consequence of the ever greater diversity of surrounding conditions. Not man considered as a moral being, but adaptation to an increasingly heterogeneous environment, is the "aim" of evolution. Thus we cannot say that the "aim" of social evolution is a moral aim. Social evolution is not concerned, primarily at least, with morality. Professor Marshall has rightly remarked that "we must call to mind the fact that the struggle for survival tends to make those methods of organisation prevail which are best fitted to *thrive in* their environment; but not necessarily those best fitted to *benefit* their environment."¹ Social evolution, like organic evolution, has as its "aim" adaptation to the environment; and selection is here also the indispensable instrument for realising this "aim."

The advent of consciousness at a certain stage of organic

¹ *Principles of Economics*, p. 678.

evolution does not imply independence of fundamental natural laws for conscious organisms. Rather must we consider consciousness as an admirable and extremely complicated instrument for assuring adaptation to highly complex surroundings. The evolution of man has brought with it profound and repeated modifications of external conditions ; and an environment thus profoundly and repeatedly modified required exceptional adaptability. Consequently the agents for effecting the complicated series of adaptations necessitated by human modification of the environment must be proportionately adjusted. Consciousness is called forth by the necessities of a modified environment ; and the fresh and ever more complicated modifications of this environment have been accompanied by an ever greater development of consciousness.¹

The fitness of inferior species in respect of their vital conditions is generally determined by their relations respectively to the physico-chemical conditions of the atmosphere, to the available means of subsistence, and to other species. The fitness of a member of the human species is determined, not only by these factors, but also by his relation to the members of his own species ; and this last factor is the most important of all. The ceaseless interaction of heterogeneous mentalities has modified the environment in every sense. By increasing the intellectual and material resources of man, it has rendered him more independent of his physical surroundings ; while, at the same time, and by an inverse method of proceeding, it has multiplied the risks of danger by creating new diseases and sources of degeneracy

¹ As Schaeffle well says : " Die organische und anorganische Welt mit allen ihren Bestandteilen sehen wir in den Personel und Vermögensbestand des sozialen Körpers eingehen und diese zahllosen Elemente durch reichste Anwendung vernünftiger Seelenkräfte verknüpft. . . . Die Universalität und hochgradige Vergeistigung seiner Stoffe und seiner Bewegungen sind die unterscheidenden und auszeichnenden Charaktermerkmale des sozialen Körpers " (*Bau und Leben des sozialen Körpers*, vol. i., p. 15. Tübingen, 1896).

as fast as it has invented new methods for combating old ones. It has constantly and uninterruptedly modified the relations of the different races of the human species to each other, thereby exterminating some and strengthening others. The modifications of the environment produced by changes in the relation of one race to the other races have frequently been too rapid for the more stable races to adapt themselves to. Under conditions such as these it is evident that consciousness is a most valuable instrument for effecting rapid re-adaptation.

The ceaseless interaction of heterogeneous mentalities, at the same time that it has developed intrasocial relations, has developed also the moral sentiments of humanity. Morality has evolved *pari passu* with consciousness, and, like the latter, it is an instrument for bringing about ever more complete harmony between civilised man and his surroundings. The inferior races of mankind have a less evolved consciousness and a less evolved morality; and to the semi-absence of these indispensable instruments of adaptation we may attribute the lack of adaptability of these races. But lesser adaptiveness means extermination; and the extermination of inferior races may in each case be attributed to a change in the environing conditions, change which found these races unprepared, and to which they were unable to re-adapt themselves with sufficient rapidity. Those races which, as Bagehot remarked, broke down the barriers of custom and tradition, and did not let themselves become subsequently entangled in a polity originally indispensable for them, must have been possessed of a highly evolved consciousness and a highly evolved morality.

Thus, although the "aim" of social evolution be not primarily a moral one, nevertheless, adaptation to the constantly changing social environment requires morality as a condition precedent. Social efficiency implies by definition moral efficiency. The society which is best adapted to the conditions of existence is that which contains the greatest number of persons *with well-*

developed social instincts and of well-developed biological fitness. But social instincts cannot be well developed, or, indeed, developed at all, without the aid of moral sentiments. How can the policy of responsibility towards future generations, feeling which implies the sacrifice of present pleasures to the welfare of future and unborn generations, and which is the social instinct *par excellence*—how can it be developed except morality furnish a sure foundation? The lack of this precious social instinct in Western society to-day may be attributed to the want of moral feeling; it is the sign of a want of harmony between modern civilisation and its environment; it proves that modern civilisation is still lacking in respect of adaptation.

There is a correlation between the lack of moral sentiment and the decline of religious organisation. Even as the action of those developmental forces which have shaped Western civilisation has evolved the moral sentiments which are such powerful factors of adaptation, so has it evolved the religious institutions in which the moral sentiments find their most concrete expression. The religions furnish an admirable example of the working of the law of adaptation. A religion is not only thoroughly adapted to the needs of those races or nations which adhere to its peculiar tenets in fact as well as in name;¹ but it

¹ We may take it that Protestantism is less adapted to the needs of the nations who have nominally adhered to it than Catholicism to the needs of those who have always held fast to the ancient faith. The proof of this assertion is to be found in the fact that the social influence of Protestantism, even in Protestant countries, is practically *nil*; an exception must, of course, be made for the Anglican Church (see above, II. Chap. I.). The curious remarks of Macaulay in his *Essay on Ranke's History of the Popes* show that he was fully conscious of the impossibility for Protestantism to make headway in Europe. The fact is that the so-called Reformation was far more a political than a religious movement; under the stress of circumstances a certain number of nations left the Church, but their scission was caused mainly by political events; the circumstances of the sixteenth century have passed away, and Protestantism has proved unable to adapt itself to the real and permanent needs of the nations of Northern Europe, incapable of influencing social evolution.

is also one of the most efficacious means for perfecting the adaptation of that people to its surroundings. Labouring under the stress and strain of the forces which work out its evolution, a nation incarnates its ideals and aspirations in the national religion, which becomes the symbol of the national greatness, of the national strength ; and such a religion becomes eventually a vast store of traditions which link the present with the past, a living and permanent reminder of the duties of racial solidarity. Further, religion confers a value on each individual life, and thereby increases the harmony between the individual and his environment. For the conditions of life demand much sacrifice from the individual ; and unless the individual be assured that it is worth his while to make the sacrifice (and he will not be convinced of this unless he be convinced of the value of life), the latter will not be made ; society will be deprived of the individual's co-operation, and the harmony between the individual and the society of which he is a member will be disturbed. Religion, by conferring the necessary value on individual life, thereby assures to society the benefit of the co-operation of all the individuals composing it ; and thus does it adapt the individual to society.

We would also point out that religion, like every other social phenomenon, is itself subject to the universal law of adaptation. The success of a religion indicates that that religion is adapted to its environment. The remarkable persistence of Buddhism in Asia, the extraordinary rise of Christianity in Europe, the partiality of certain races for Mohammedanism, are all to be explained as phenomena of adaptation, as illustrating this fundamental law of life. Christianity is adapted to the needs of the Western world ; and it is because it is so thoroughly adapted that it has been able to interweave itself so closely with the fabric of Western civilisation.

When we consider all phenomena as conforming to the fundamental law of adaptation, we are in a better position to judge

of the irrationalism of those who would fain see in our religious institutions a mere superstructure, a mere development of primitive ideas concerning the life of the dead, destined to disappear with the advance of social evolution. The very fact of the complete adaptation of these religious institutions to the social life of the Western world shows them to respond to a *want* of our civilisation ; for had the environment not been favourable, these religious institutions could never have been evolved. The history of the Church shows the latter to have adapted herself with equal ease to the most heterogeneous situations : in the Middle Ages she was a feudal power ; to-day she shows herself not less capable of adaptation to a wholly different environment, as may be seen by a glance at her progress in the United States. But if the Church be thus capable of adapting herself to all the changing needs of the Western world, what does this mean if not that the Western world, in all the numerous phases of its evolution, has a fundamental need of a suprasocial and supra-rational ideal embodied in an institution which, while changing its outward forms to adapt them to changed situations, remains unchanged in its essential parts ? The "dogmatic intolerance" of the Church is a symbol of the unity underlying the diversity of social forms. This underlying unity is expressed by the law that a society, in order to survive in the struggle for existence, must contain a majority of persons with well-developed social instincts and of well-developed biological fitness. That law is immutable ; and all the outward changes in the form and structure of societies are brought about by the imperative necessity of conforming to that law ; that is to say, all such outward changes are adaptations to the environment—adaptations which are indispensable if a society is to survive in the struggle for existence. The Church it is which embodies the suprasocial principles of integration and solidarity which alone can secure adequate social adaptation. For a society is possessed of reason and consciousness ; and it can, if it will, knowingly deviate

from the straight road ; it can check for a time the working of natural law, as our Western civilisation is endeavouring to do to-day. But the price to be eventually paid is heavy, and the bill run up by the folly of the present generation must be met by the generations that come after. If the religious organisation of society be a living force, such waste of social strength will be avoided ; for society will then be strongly integrated ; consequently, it will be conscious of its solidarity with the generations to come, and of its responsibility towards them. That society will survive in the struggle for existence which is most greatly conscious of this solidarity. We may say, therefore, that the environment of every society requires the development of such consciousness as a condition of adaptation ; and the society in which such consciousness is lacking is not fully adapted. In so far as the Church embodies principles of social solidarity and obtains effective recognition of these principles from the members of society, we may say that she secures the adequate adaptation of society to its environment.

The forms of the religious organisation vary and must necessarily vary ; for otherwise the religious organisation would be rendered useless by its failure to adapt itself to the changing needs of society ; but the essence of that organisation remains unchanged. At an epoch like our own, when the fundamental laws of existence are neglected and apt to be forgotten, the duty devolves upon the religious organisation of bringing home to Western civilisation the necessity for greater social integration in the interests of the race ; *and this is the task of the religious organisation at all times and in all ages.*

But the nature of the religious organisation varies according to the nature of the environment. Christianity, which is so well adapted to Western needs, presents the appearance of an anomaly when transported into Asiatic climes unsuited to it. Buddhism is adapted to its environment in Asia, even as Christianity is adapted to its environment in Europe. Never-

theless, Buddhism does not contain those vivifying principles of social regeneration inherent to Christianity; especially do we find it less adaptable, consequently less fit for carrying out the primary task of a religious organisation; and the best proof of this lies in the fact that, whereas European civilisation has developed steadily during the last fifteen centuries, Asiatic civilisation, which is far more ancient and venerable, has remained stationary.

The sociological conclusions which we have reached were preceded, in the first part, by a somewhat lengthy study of the theory of descent. It may be asked what connection can conceivably exist between this biological problem and the problem of religion as a social factor. We may reply that the theory of descent is not merely a biological question; but that the problems of heredity and selection interest—or ought to interest—the sociologist quite as deeply as they do the biologist; for both are problems of fundamental social importance. That this is the case, is indeed so obvious that we will not labour the point. It will suffice to say that training in sociology must be preceded by training in biology; and that none of the great problems of sociology can be understood, much less solved, unless the sociologist possesses sufficient training in biology, and sufficient knowledge of the facts concerning heredity and selection.¹ And it was for this reason that we began this work by a study of these fundamental questions.

The object which we had in view was, first of all, to expound the facts which recent biological research has brought to light

¹ It would suffice to refer to the best-known books of Herbert Spencer—*The Study of Sociology*, *The Man versus the State*, and *Social Statics*—in order to justify our affirmation. But we may make particular mention also of the classical work of Schaeffle, *Bau und Leben des sozialen Körpers* (Tübingen, 1896); and also of the valuable work of O. Ammon, *Die Natürliche Auslese beim Menschen* (Jena, 1893). A more recent work still is that of René Worms, *La Société comme Organisme*. Paris, 1896.

concerning heredity and selection ; and, having examined the nature of some of these facts, to inquire into the actual condition of social evolution, in order to see whether, in the light of the biological knowledge which we have gathered together under the heading of the theory of descent, the direction of social progress is actually tending towards a biological improvement of the race. Our inquiry having led us to conclude that this was not the case, we set ourselves the task, in the second place, of trying to ascertain what conditions of social evolution would be most favourable in order that the maximum both of organic and of traditional progress might be realised. As traditional progress—the progress of social evolution, properly so called—cannot be effected except by a race possessing organic fitness ; and as the maintenance of traditional progress is dependent on the maintenance of organic fitness, since a nation possessing traditional superiority, but organically inferior, must succumb before a nation which combines fitness in both respects ; we see at once that a knowledge of the laws governing heredity and selection—the factors on which organic fitness depends—is indispensable to the sociologist.

The result of our inquiry into the actual condition of social evolution was not favourable ; grave symptoms exist which point to a deterioration alike in the biological and traditional spheres of Western civilisation. The figures we have given concerning the increase of insanity, and the facts we have noticed in regard to alcoholism and syphilis, and to the general humanitarian trend of modern culture, are not such as to inspire us with optimism. Equally alarming are the figures we have given relative to the comparative marriage and birth rates among the different classes of the population, which point to a multiplication of the lower classes at the expense of the cultured ones. And along with these symptoms of biological deterioration we find symptoms, quite as unmistakable, which point to something radically wrong in the direction of our traditional evolu-

tion. The constant increase of suicide—one of the most remarkable of social phenomena—says little in favour of the institutions and spiritual organisation of a society which is thus on the path of disintegration. Far from traditional progress being developed *pari passu* with organic progress, and *vice versa*, we are, under the present conditions of social evolution, going steadily along the path which leads eventually to bankruptcy all along the line. As Professor Haycraft has observed: "We may view, and not without inquietude, the probability that our statistics, as far as they go, indicate that racial deterioration has already begun as a sequence to that care for the individual which has characterised the efforts of modern society. The biologist, from quite another group of facts, has independently arrived at conclusions which render this view in the highest degree probable."¹ The statistician, examining the figures given by the Registrar-General concerning the increase of general mortality, and of mortality from pulmonary tuberculosis in particular, among the "reproductive classes"—an increase which has its counterpart in the diminution of juvenile mortality, and which signifies the multiplication of the category of weaklings at the expense of the category of normality, the better protection of the enfeebled young at the cost of diminished protection for the race, by allowing the enfeebled young to attain maturity and reproduce themselves—the statistician, we say, will come to the same conclusion as the biologist who considers the increase of insanity, of nervous disease, of alcoholism, of general paralysis: the conclusion, namely, that we are on the path of racial degeneracy. And the sociologist, who completes the data of the statistician and the biologist by a consideration of the effects of the military system on the organic welfare of the race, or of the effects of the general advance in the age of marriage, or of the results of the under-multiplication

¹ J. B. Haycraft, *Darwinism and Race Progress*, p. 68. Swan Sonnenschein, 1900.

of those classes whose multiplication is most valuable to society, or of the effects of the economic system in disturbing the normality of the death-rate, the marriage-rate, and the birth-rate—the sociologist, we may add, will come to the same conclusion, strengthened by further evidence.

We have stated, in the last chapter, that the stability of the social structure is dependent on the stability of the spiritual organisation of society ; this may seem in contradiction with our conclusion that traditional progress—which implies the development of a coherent spiritual organisation—cannot be effected except by a race possessing organic fitness. And yet this latter affirmation is but a completion of the former. The spiritual organisation, so necessary in order to effect and to maintain the integration of society, is itself a fruit of organic superiority. The inferior races are incapable of attaining to that degree of social cohesion which is implied by the formation of a spiritual organisation. Social progress is ultimately dependent on biological fitness ; and in order to maintain a position once attained, it is necessary to prevent the conditions of social evolution acting in such a manner as to impair the biological fitness of the race. The effort implied by the continuous maintenance of bio-social efficiency can be accomplished only by a society possessing integration and stability ; and those latter qualities are engendered by the existence of an adequate spiritual organisation.

The truth of this proposition will be clearly seen when we bear in mind that the spiritual organisation of a society simply embodies those beliefs which are the expression of the power of expansion of a race, its need for expansion. On the one hand in order to realise a considerable degree of expansion, in order to go forth conquering and to conquer, a nation must possess an adequate spiritual organisation guaranteeing its integration and stability ; but, on the other hand, a nation capable of great expansion is necessarily a nation of biological superiority. Thus

we see that, while the maintenance of positions once acquired depends on the spiritual organisation of a nation ; nevertheless, the expansive power of which the original conquest of those positions, and also the formation of a spiritual organisation, are the results, is itself due to biological capacity.

But when a nation, or a race, has achieved certain conquests, when it has attained a certain degree of power, it is above all things necessary to prevent retrogression from setting in, as it often does, if those conditions of conflict under which all expansion is produced are allowed, by artificial interference, to relax. This is the great objection to the Communist theory of the State—that it does, indeed, suspend these primordial conditions of progress. Mr. Benjamin Kidd has said very truly, with reference to the Communist State, that “the evolutionist who has perceived the application of that development which the Darwinian law of natural selection has undergone in the hands of Weismann, is precluded at the outset from contemplating the continued success of such a society. The evolutionist who has once realised the significance of the supreme fact up to which biology has slowly advanced—namely, that every quality of life can be kept in a state of efficiency and prevented from retrograding only by the continued and never-relaxed stress of selection—simply finds it impossible to conceive a society permanently existing in this state. He can only think of it existing at all on one condition : in the first stage of a period of progressive degeneration.”¹ But the Socialist State is not the only State in which such a suspension of the primordial conditions of progress can take place. A State governed by an oligarchy, or by a plutocracy, is equally liable to degeneration. In our Western society of to-day the stress of competition brought about by industrialism has not proceeded *pari passu* with growing integration of society through a disciplined spiritual organisation. For we have seen that it is not *only* the conditions

¹ B. Kidd, *Social Evolution*, p. 296. Macmillan.

of conflict which are necessary to the development of a society and to the subsequent maintenance of the social efficiency attained under these conditions ; what is equally necessary is that individual life, which is staked in the conflict, should possess an inherent value sufficient to stimulate the individual to the further effort which all conflict implies. The Socialist system suppresses one of the fundamental conditions of social progress, that of conflict ; but the Capitalist system, as we know it to-day, suppresses the other fundamental condition—namely, the value of individual life.

It is only by means of a combination of these two conditions that social progress can be realised and subsequently maintained. It is because of the conditions of existence that conflict is the law of all development, whether biological or social ; but in the social sphere, where we are dealing with creatures possessed of reason, it is necessary that this conflict should possess an adequate sanction. Otherwise we risk one of two things : either the suppression of the conditions of conflict, and the introduction of a Socialistic régime ; or else the maintenance of the social anarchy existing at the present moment ; and neither solution can be anything but the precursor of degeneracy and decay. Even if our Western civilisation, thus lowered in tone by the misdirection of its evolution, does not succumb to a foreign civilisation which has not been subjected to the same unhealthy conditions ; nevertheless, it will finally succumb as the result of internal decay, repeating on a larger scale the history of Turkey.

Thus, in whatever light we look at the question, we come to the same conclusion as to the necessity for a spiritual organisation assuring the integration and stability of society. If the spiritual organisation, even in rudimentary tribes, be but an expression of that tribe's need of expansion and power of expansion, which, in turn, is attributable to organic superiority ; nevertheless, this organic superiority can manifest itself only on condition that the tribe be strongly integrated by adherence to a common

sanction, as Bagehot long since pointed out ; and adherence to a common sanction is synonymous with spiritual organisation. The power of expansion is thus rendered possible only by strong social integration by means of a spiritual organisation ; and, if this be the case, we are justified in seeing in this social integration a corollary of the conditions of conflict so indispensable to social progress. In other words, the conditions of conflict, so necessary, not only to all social evolution, but to the maintenance of the standard already attained, can have their highest potency only if social integration be at the same time realised.

Therefore, if biology has indeed shown us that " every quality of life can be kept in a state of efficiency and prevented from retrograding only by the continued and never-relaxed strain of selection," it has, at the same time, shown us that this indispensable conflict implies, as a concurrent condition, adequate social integration ; and this latter can be attained only through spiritual organisation.

Without recapitulating what we have said in previous chapters, we may say, therefore, that a supra-rational ideal is necessary for the individual and also for society. The very notion of a spiritual organisation implies such an ideal. We ourselves stand respectfully on the border-land ; it is not permitted to us to cross the frontier which marks off the domain of science from the domain of faith. But we are, none the less, conscious of the immense importance of the latter, both for social life and for the life of the individual ; and the conclusion we have arrived at as to the imperative necessity of religion in social life may, perhaps, by reason of this fact, be regarded as the more impartial. The sociologist must above all things convince himself of this fundamental fact : the study of the action of natural selection in social life cannot be separated from the study of the spiritual organisation of society. For it is not conflict alone, but conflict and integration, which are the essential requisites for social life ; and if conflict is unceasingly brought about by

the inherent tendency of life to expand, the integration of society, indispensable for regulating the conditions of the conflict, can be ensured only by the religious organisation. We must beware of considering only the biological aspects of social selection; *social* fitness is as necessary as organic fitness, and the importance of religion lies precisely in that its task is that of maintaining social fitness.



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THE END



